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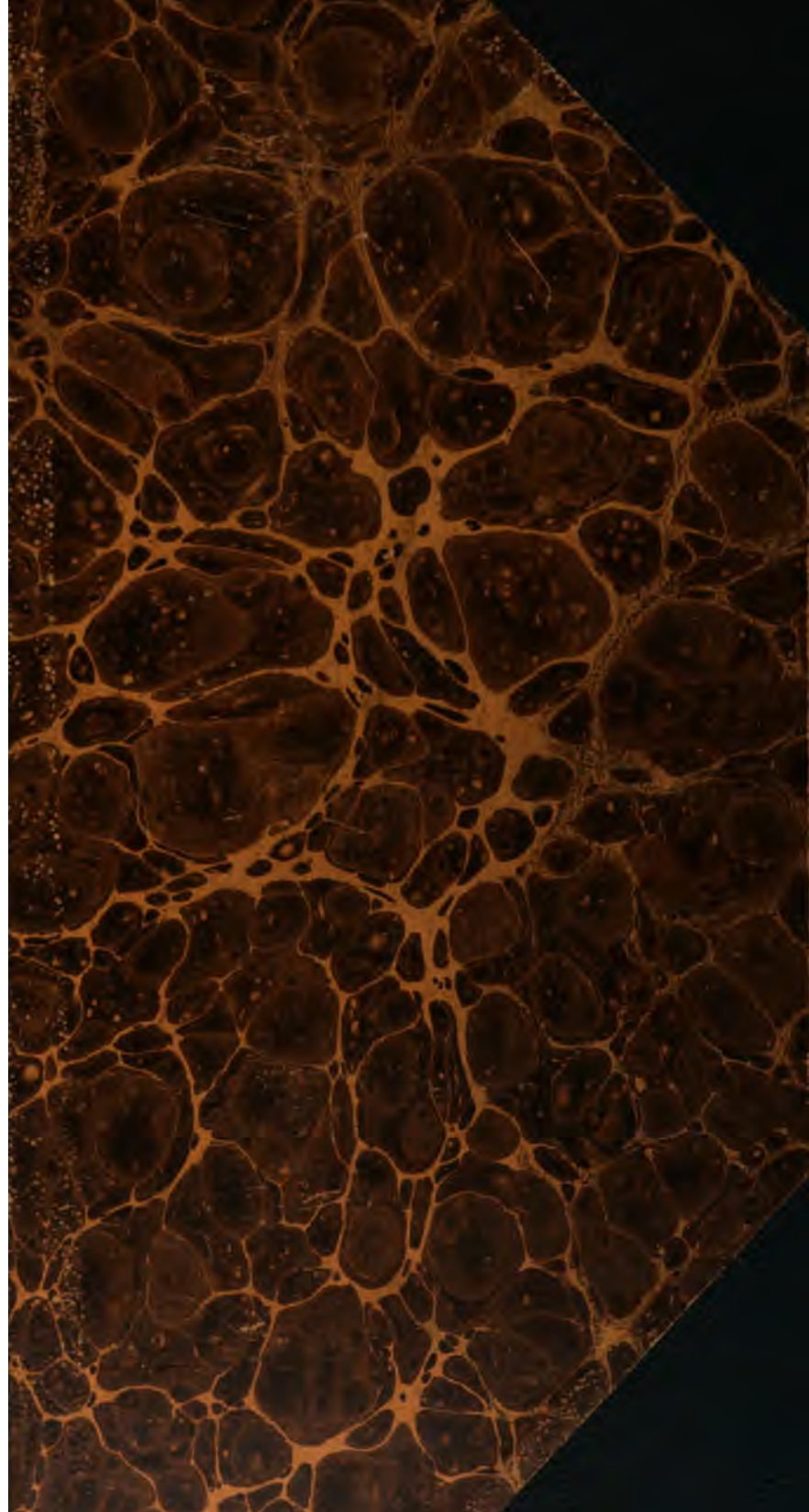
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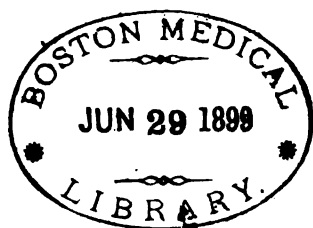
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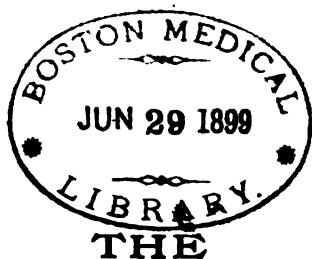
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Original Communications.¹

A STUDY OF THE DEFORMITIES OF THE JAWS AMONG THE DEGENERATE CLASSES OF EUROPE.

BY EUGENE S. TALBOT, M.D., D.D.S.²

THE Twelfth International Medical Congress in Moscow, Russia, afforded me a long-sought-for opportunity not merely to visit Russia, but also to cover nearly all the countries of Europe.

In visiting the various cities I made special observations of the degenerates in each of the various institutions for the defective classes. The objective points of interest were the prisons, insane hospitals, schools of idiocy, foundlings' homes, etc. The features of the soldiers, police, and cabmen, as well as the citizens themselves, were incidentally noted for the purpose of comparison. These observations, however, were for an entirely different purpose, the object of this paper being to record results as to the deformities of the jaws and teeth of the mature degenerate classes.

In a prison in Athens containing four hundred and fifty-two convicts not a single V-shaped or saddle arch was found, although

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Fellow of the Chicago Academy of Medicine.

slight irregularities of the teeth due to local causes were observed. Arrest of the lower jaw, however, was the rule, which, together with the recession of the forehead, gave to the individual an idiotic appearance. Irregularity, in the relation of the upper to the lower jaw due to excessive and arrest of development was very common. The third molars, upper and lower, were present, but the vault was lower than the average.

In a Greek insane hospital (idiots are here confined with the insane) in Constantinople, of three hundred and thirty-two inmates (equally divided as to sex), only one case of V-shaped arch was noted; the vaults low; upper jaws large and full; but forty-eight per cent. of the lower jaws were arrested; third molars normally developed.

In an Armenian insane hospital (idiots are here confined with the insane) in Constantinople, of two hundred and fifty inmates (one hundred and seventy-five males, seventy-five females), there was one partial V-shaped arch; the third molars normal, and the lower jaw arrested in eighteen per cent. There were many mongoloid faces.

In the Vienna Insane Hospital, of three hundred and twenty-six insane and idiots, there were four partial V-shaped and one saddle-shaped. The third molars were normally developed in three hundred and eleven cases.

In a prison in Moscow, with two thousand convicts (two hundred and forty-seven of which were in the hospital), there were no contracted jaws or irregularities of the teeth. The jaws were very large and vaults low. In the Moscow Reform School there were one hundred and twelve boys, ranging from ten to eighteen years. Three had partial V-shaped arches. No saddle-shaped arches. The jaws, as a rule, were large and broad, with low vaults.

In a Moscow insane hospital, with four hundred patients, of which twelve were idiots, no contracted arches were observed. The jaws were large and broad, with low vaults.

In the Stockholm Insane Hospital, with two hundred and seventy patients, there were six V-shaped arches, twelve partial V-shaped, four semi-V-shaped, twenty-three saddle-shaped, four partial saddle-shaped, eleven excessively developed upper jaws, three excessively developed lower jaws, nine hypertrophy of the alveolar process, forty-two missing third molars, six missing laterals. Deformities of individual teeth numerous. The School of Idiocy, of Stockholm, with one hundred and twenty inmates (eighty boys, forty girls), gave the following results :

BOYS.

Normal jaws	14
V-shaped	12
Partial V-shaped	10
Semi-V-shaped	4
Saddle-shaped	8
Partial saddle	1
Semi-saddle	2
Hypertrophy of the alveolar process	32
Macrocephalic	12
Microcephalic	5

GIRLS.

Normal jaws	15
V-shaped	1
Partial V-shaped	5
Semi-V-shaped	5
Saddle-shaped	8
Semi-saddle	1
Hypertrophy of the alveolar process	14
Macrocephalic	6
Microcephalic	4

One boy, aged thirteen, who was able to take care of himself, had a head thirty-two inches in circumference, one of the largest on record. The prison at Hamburg had eighteen hundred convicts. Large, well-developed jaws were the rule. Asymmetry in development, however, was frequently noticed, as well as other stigmata.

The School of Idiocy at Hamburg had six hundred children (three hundred and ninety-six boys, two hundred and four girls), and gave the following results:

BOYS.

Normal jaws	62
V-shaped	12
Partial V-shaped	16
Semi-V-shaped	8
Saddle	4
Partial saddle	8
Semi-saddle	2
Hypertrophy of the alveolar process	46
Macrocephalic	8
Microcephalic	4

GIRLS.

Normal jaws	28
V-shaped	4
Partial V-shaped	7
Semi-V-shaped	3
Saddle	1
Partial Saddle	1
Semi-saddle	3
Hypertrophy of the alveolar process	25
Macrocephalic	5
Microcephalic	2

One boy of thirteen had excessive lower jaw, being one and a half inches beyond normal upper. A most remarkable case.

In the Insane Hospital and School of Idiocy at Amsterdam there were thirteen hundred and thirty insane and two hundred and fifty-five idiots. In the insane no contracted arches were found. Vaults low, sixty-seven. Hypertrophy of the alveolar process. No third molars missing.

IDIOTS.

Males	116
V-shaped	1
Partial V-shaped	3
Semi-V-shaped	1
Saddle	1
Females	139
V-shaped	1
Partial V-shaped	2
Hypertrophy of the alveolar process	19

The vaults low and jaws well developed.

The School of Idiots, Paris, six hundred and sixty-seven inmates (five hundred boys, one hundred and sixty-seven girls), gave the following results :

BOYS.

V-shaped	1
Partial V-shaped	40
Semi-V-shaped	2
Saddle	2
Partial saddle	1
Semi-saddle	4
Hypertrophy of the alveolar process	7

GIRLS.

V-shaped	1
Partial V-shaped	6
Semi-V-shaped	1
Saddle	8
Partial saddle	2
Semi-saddle	1
Hypertrophy of the alveolar process	4

The vaults were low.

Having permits to visit the following prisons in Paris, Ci-apés, Le Dépôt, Grande Roquette, Mazas, La Santé, St. Pélagie, and St. Lazan, after examining the convicts in the first four, aggregating two thousand six hundred, I abandoned the task, since no deformities of the jaws were observed of special value.

In England I examined the following public asylums: 1. Earlswood Idiot Asylum. 2. Darenth School for Children. 3. Darenth School for Adults, Hanwell Hospital for the Insane, and the following private institutions: 4. Mrs. Langdon Down. 5. Dr. Shuttleworth. 6. Dr. Beach.

A day was spent at the Criminal Insane Hospital, Broadmore. Fully one-half the inmates were so violent that the task was given up. Enough, however, was observed to warrant my stating that fully eighty to eighty-five per cent. had marked deformities of the jaws and teeth.

Hanwell Hospital for the Insane, Southall, had two thousand and eighty patients. These people were mostly of the dependent class, who went insane after maturity; hence the class of deformities which are under discussion were not common. Hypertrophy of the alveolar process and excessive and arrested development of the jaws were, however, frequently noticed. Stigmata of degeneracy of head, face, eyes, ears, body, hands, and feet were the rule.

Earlswood Idiot Asylum, Red Hill, Surrey, contained six hundred and seventy, of which four hundred were boys and two hundred and seventy girls.

BOYS.

Normal jaws	31
V-shaped	108
Partial V-shaped	69
Semi-V-shaped	11
Saddle	19
Partial saddle	27
Semi saddle	13
Marked arrest of upper jaw	104

Marked protrusion of upper jaw	64
Marked protrusion of lower jaw	11
Marked arrest of lower jaw	306
Lateral incisors arrested	46
Lateral incisors lost	28
Third molars lost	180
Showed malnutrition of teeth	160

GIRLS.

Normal jaws	24
V-shaped	67
Partial V-shaped	86
Semi-V-shaped	24
Partial saddle	8
Semi-saddle	23
Cleft palate	1
Marked arrest of upper jaw	87
Marked protrusion of upper jaw	24
Marked protrusion of lower jaw	1
Marked arrest of lower jaw	237
Lateral incisors arrested	30
Lateral incisors lost	16
Third molars lost	85
Showed malnutrition of teeth	78

Darenth School for Idiots, Dartford, Kent, had one thousand inmates (six hundred and forty boys, three hundred and sixty girls).

BOYS.

Normal jaws	150
V-shaped	143
Partial V-shaped	140
Semi-V-shaped	105
Saddle	85
Partial saddle	20
Semi-saddle	10
Marked arrest of upper jaw	450
Marked protrusion of upper jaw	150
Marked protrusion of lower jaw	23
Arrest of lower jaw	600
Lateral incisors arrested	68
Lateral incisors lost	42
Third molars lost	388
Hypertrophy of upper jaw	150

GIRLS.

Normal jaws	90
V-shaped	118
Partial V-shaped	80

Semi-V-shaped	65
Partial saddle	8
Semi-saddle	20
Marked arrest of upper jaw	810
Marked protrusion of upper jaw	90
Marked protrusion of lower jaw	9
Arrest of lower jaw	340
Lateral incisors arrested	32
Lateral incisors lost	19
Third molars lost	111
Hypertrophy of upper jaw	90

Darenth School for Adults (Idiots), Dartford, Kent, contained one thousand and fifty inmates (four hundred and fifty males, six hundred females).

MALES.

Normal jaws	60
V-shaped	105
Partial V-shaped	98
Semi-V-shaped	53
Saddle	81
Partial saddle	5
Marked arrest of upper jaw	295
Marked protrusion of upper jaw	162
Marked protrusion of lower jaw	8
Arrest of lower jaw	409
Lateral incisors arrested	48
Lateral incisors lost	37
Third molars lost	442
Hypertrophy of upper jaw	58

FEMALES.

Normal jaws	40
V-shaped	177
Partial V-shaped	121
Semi-V-shaped	79
Partial saddle	8
Semi-saddle	10
Marked arrest of upper jaw	436
Marked protrusion of upper jaw	209
Marked protrusion of lower jaw	17
Arrest of lower jaw	580
Lateral incisors arrested	72
Lateral incisors lost	62
Third molars lost	597
Hypertrophy of upper jaw	36

Of the children, five hundred and seventy-six boys showed malnutrition in utero; two hundred and eighty-two girls showed mal-

nutrition in utero. Of the adults, three hundred and ninety-six males showed malnutrition in utero; five hundred and seventy-eight females showed malnutrition in utero.

Mrs. Langdon Down's School for Idiots, Normansfield, Hamptonwick, contained one hundred and forty-seven inmates (ninety-seven boys, fifty girls).

BOYS.

Normal jaws	12
V-shaped	36
Partial V-shaped	20
Semi-V-shaped	15
Saddle	9
Partial saddle	13
Semi-saddle	28
Arrest of upper jaw	86
Third molar missing	92
Lateral incisors missing	16
Teeth showing arrest and grooves	46
Hypertrophy of the alveolar process	19

GIRLS.

Normal jaws	5
V-shaped	10
Partial V-shaped	9
Semi-V-shaped	12
Saddle	7
Partial saddle	1
Semi-saddle	16
Arrest upper jaw	45
Third molar missing	47
Lateral incisors missing	8
Teeth showing arrest and grooves	21
Hypertrophy of the alveolar process	7

Of the twelve normal dental arches (males) seven were hypertrophied. Of the five normal dental arches (females) three were hypertrophied.

Dr. Shuttleworth, Private Idiot School, Richmond Hill, had twelve boys and girls. There was one normal jaw, but no laterals. There were two V-shaped, five partial V-shaped, one semi-V-shaped, two partial saddle, and one semi-saddle-shaped jaw. Four hypertrophy of alveolar process. Nine had notched and pitted teeth, and all high vaults. These patients were too young to decide as to the number of third molars, but five had one or both laterals missing.

Dr. Fletcher Beach, Winchester House, Kingston Road, had thirteen patients. There were three V-shaped, eight partial V-

shaped, and one semi-V-shaped jaw ; six hypertrophy of the alveolar process ; eight had notched and pitted teeth ; all high vaults. These patients were also too young to decide as to number of third molars. Four had one or both laterals missing.

These reports are tabulated in the order in which they were made. They show a gradual increase of degeneracy from the examinations made in Greece to those in England. It will also be noticed that the deformities of the jaws and teeth are more numerous among the better classes, such as are shown in the private institutions of Mrs. Langdon Down and Drs. Shuttleworth and Beach, than among those of the poorer classes in the public institutions of England.

From examinations previously made in Spain, Italy, and Switzerland among the degenerate classes, a very small percentage of deformities of the teeth and jaws was found. As compared with the American-born degenerate classes, the percentages are greater than those of the Latin races, and the Slavs, Germans, Austrians, Danes, and Dutch, but from twenty-five to thirty-five per cent. less than the Swedes and English.

These observations have proved to me what I long ago suspected from my studies of the degenerate classes which have come to America, and which fill our public charitable institutions as well as our prisons, that the higher the intellectuality the greater the degeneracy of the jaws and teeth.

SPRING LEVERS FOR REGULATING TEETH.¹

BY W. S. DAVENPORT, PARIS, FRANCE.

CASE I.—Figs. 1 and 2 illustrate a case in practice before and after treatment.

Fig. 2 shows a band in position, with a tube soldered to one side. A piano-wire spring lever was so bent that when one end was passed through the tube *P*, power was obtained by pressing tightly against the neighboring canine.

The tube *W* represents the weight ; the point *F* becomes the fulcrum by touching the outer edge of the tooth to be rotated. With this simple appliance a tooth becomes practically self-rotating.

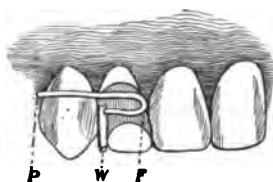
¹ Presented to the American Dental Club, of Paris.

CASE II.—A cap was made with a post soldered to one corner; the lever was slipped over the post and the end sprung up against

FIG. 1.



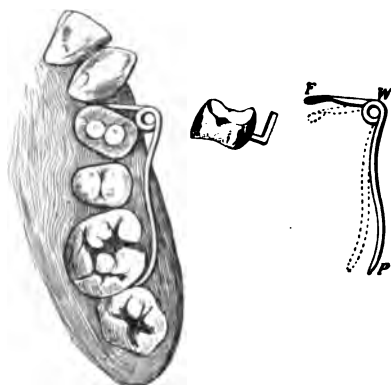
FIG. 2.



Case I.

the neck of the molar, giving a force as obtained in a lever of the second class. See *P*, *W*, and *F*.

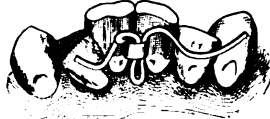
FIG. 3.



Case II.

CASE III.—A double gold band with a flattened tube attached was cemented to the two central incisors. Through the tube was

FIG. 4.



Case III.

sprung the double spring lever, which brought force to bear on the two laterals, the position of which was thus corrected.

Every day or two the springs were removed and bent a little more, which gave renewed power to continue their action.

THE THERAPEUTIC TREATMENT OF INFECTED TOOTH-ROOT CANALS.¹

BY GEORGE W. WARREN, D.D.S.

MR. PRESIDENT AND FELLOWS OF THE ODONTOLOGICAL SOCIETY OF PENNSYLVANIA,—The subject to which I shall ask your attention for a few minutes this evening, and which President Brubaker requested me to present, is not a new one, but is of much importance and full of interest to every practitioner of dentistry.

There have been many methods and remedies recommended for the treatment of putrescent tooth-root canals; in fact, for nearly half a century this subject has laid claim to the attention of dentistry. To be more accurate, it was about forty-five years ago that it was first considered feasible to restore to usefulness, by therapeutic treatment, a tooth which had been unfortunate enough to have lost the vitality of its principal nourishing organ,—the pulp. As far as I can learn, the pioneers in this opinion and treatment were the late Dr. Elisha Townsend and the venerable Dr. John Rich, of New York, now of Washington, D. C., who were soon followed by Atkinson, of New York, and Flagg, Truman, and Peirce, of Philadelphia. In some respects the treatment to-day is precisely the same as recommended by these gentlemen at that time. First, they advised free access to the infected parts; secondly, cleanliness,—that is, the free removal of the decomposed parts and the irrigation of the canals. These to-day are recognized as the two necessary preliminary steps. It is upon the following two that there has been such a diversity of opinion,—that is, the remedies to be used as antiseptics and germicides, and the material best adapted for filling the root-canals after the treatment.

The first remedy claiming to possess the necessary properties for the successful treatment of such teeth, whether there was an alveolar abscess or not, was a saturated solution of iodine in creosote. This proved so unpleasant to handle and unsatisfactory in its results that it was soon discarded. Then followed carbolic acid and pure beechwood creosote. These have all had their advocates, have been experimented with, and by many discarded. Iodoform was introduced and used by many, having its advocates to-day. Also bichloride of mercury and chloride of zinc have been em-

¹ Read before the Odontological Society of Pennsylvania, October 8, 1897.

ployed to a considerable extent. One of the firmest adherents to the last two drugs was the late Dr. Abbott, of New York. He claimed, I believe, to use bichloride of mercury for putrescent canals and chloride of zinc in the treatment of teeth with alveolar abscesses, to the exclusion of all other remedies.

A more recent system is that introduced by Dr. Emil Schreier, of Vienna, known as the kalium-natrium (potassium and sodium) treatment. This preparation of potassium and sodium has found favor with many practitioners. It is claimed that by introducing it into a necrotic pulp or the putrescent contents of a root-canal, which consist largely of water, fats, and fatty acids, potassium and sodium hydroxides are formed, which in combination with the fat of the pulp form soap. This saponified material is readily removed and the canal filled. Then came the recommendation of nitrate of silver. Nearly five years ago I received a communication from Dr. C. T. Stockwell, of Springfield, Mass., which was published in the *INTERNATIONAL DENTAL JOURNAL*, recommending the use of this drug, especially in the treatment of those canals which we sometimes find, where it is very difficult or impossible to reach and thoroughly cleanse the extremity.

He said, in part, "With the rubber dam in place, I introduce and carry as far as possible into the canals a solution, fifty per cent. and upward, of nitrate of silver, afterwards sealing in the chamber a pledget of cotton saturated with the same, and let it remain for a day or two. Then fill as successfully as possible with such material as circumstances indicate." My feeling in this direction was that the possibility of permanently discoloring the teeth so treated being great, I should treat it in my practice as I did the introduction of copper amalgam into this country,—let it entirely alone; leaving to the more zealous the experimentation along these lines. After waiting this length of time, I wrote to Dr. Stockwell a few weeks ago asking for results. His reply endorses my previously formed opinion of the drug, wherein he says, "I now seldom use it; it does the work, but I feel so sure of the teeth becoming darkened thereby that I use it only in those cases where other methods do not seem practical."

Among other preparations which have been brought prominently before us in recent years is sulphuric acid and sodium peroxide, and these have, in the hands of some practitioners, given considerable satisfaction. There are also other preparations which have been recommended, but I shall not occupy your time by enumerating them.

It is my belief that the relative value of drugs cannot be dissociated from certain medicinal properties, and that these properties are not only determined by scientific investigations through experiments in the test-tubes in our laboratories, but in addition to this, and of greater importance, I should say, is the experience derived from the every-day practice of careful and studious practitioners. We all know that certain drugs, when surrounded by certain conditions, will give us certain definite results, but let us change the conditions, as from the test-tube to the root-canal surrounded by an inflammatory condition, and our results are often quite different. Now, I feel sure of my position in stating that it is the consensus of opinion with a larger number of teachers and experimenters that the agents we should employ in the treatment of putrescent root-canals should be (1) germicidal, (2) penetrating, and (3) non-irritating in their effect. And after a varied clinical experience I believe the essential oils more nearly meet these requirements than any other remedies we have at hand; notably, the oil of cinnamon, oil of eucalyptus, and oil of cloves. These oils have decided germicidal properties, are penetrating, and are mostly non-irritating to the tissue, and, in addition, their viscosity no doubt prevents, in a measure, the passage of bacteria.

I will briefly give you a report of two selected cases illustrating the line of treatment which I have indicated. About three years ago a lady called upon me for treatment, who, in the pursuance of her profession, is required to travel from city to city during the greater part of each year, thus requiring and receiving attention from several dentists. She reported that the first inferior molar on the right side had for a long while been the source of much annoyance. It had been treated by numerous dentists, would apparently return to the normal condition, but with every cold she contracted the alveolar inflammation would return. I inspected the tooth in question, and found in it a large amalgam filling; while on the border of the maxilla immediately below, and opposite the anterior root, was an inflammatory bunch, such as we have all seen, which seemed quite dense, and sore to pressure. I removed the filling from the tooth, and from the roots took a quantity of cotton, having a composite odor, in which I could detect that of creosote. I enlarged the canals slightly by means of the Gates-Glidden drills, irrigated them thoroughly with peroxide of hydrogen and warm water, then introduced on a few fibres of asbestos a dressing of oil of cinnamon, closing the cavity with gutta-percha.

The patient was visiting my office nearly every day for the week following, having a partial bridge denture inserted, which gave me an opportunity to watch the swelling disappear and the tissues return to a normal color and condition. At the close of her stay in this city she called, as I had requested, to have the tooth filled. I removed the dressing, dried the canals thoroughly with warm air, and closed the apical ends with a small point of gutta-percha; then filled the roots with oxychloride of zinc, and closed the crown cavity with an alloy filling and dismissed the case. Now we have the most interesting and important part of the matter. After an absence of two years the patient again called upon me for services, and reported that this tooth had not given her a moment's uneasiness during her absence, and had been quite as useful as any other of the similar organs.

Case number two is the treatment of the left superior lateral incisor for a lady forty years of age. It so happened that I was inserting an artificial crown on either side of the tooth mentioned, and it was the opinion of the patient that the diseased tooth should be extracted and the space bridged. This tooth had for many months troubled the patient, being somewhat loosened, and there being a slight discharge of pus through a fistulous opening on the gum opposite the apical end of the root. It had been treated in Chicago and in this city, the last dentist filling the root with gold. After securing the patient's permission to treat the tooth, I removed the gold from the canal, washed thoroughly with peroxide of hydrogen, then with my hypodermic syringe I injected oil of cloves into the canal until it ran out through the fistula on the gum; this was followed by a few fibres of asbestos saturated with oil of cloves being placed in the canal and the cavity closed with gutta-percha. After remaining about three weeks without any evidence of a recurrence of the discharge of pus, the dressing was removed, and a point of gutta-percha was passed into and through the end of the root until it made its appearance at the gum surface, and the cavity filled with the same material. The patient then left the city for the summer months. Upon her return in the autumn, I found that the tooth was entirely comfortable, quite firm, and that the tissues had settled down to a more normal condition, leaving the point of gutta-percha standing slightly above the surface; this point was then grasped with a pair of tweezers and twisted off at the end of the root. A permanent filling was then placed in the tooth, which has been a useful organ of mastication unto this time, there being no recurrence of the inflammatory condition.

In bringing these cases before you I do not present them as isolated ones, but as cases of frequent occurrence, illustrating, as I believe, the value of the essential oils in the therapeutic treatment of infected-root canals.

FORMALDEHYDE IN SOLID FORM.

BY WILLIAM ROLLINS, BOSTON, MASS.

As you have considered formaldehyde of sufficient interest to dentists to publish a long article from one of the medical magazines, you may possibly find room for this short note on one of its dental applications. If we make a very strong aqueous solution of this gas, part of it slowly assumes the solid form and is precipitated. When this is dried and the pulp-chamber in a tooth filled with it, after a time it is all reconverted into a gas and thoroughly disinfects the whole tooth. If there is an abscess at the root, by sealing in the solid formaldehyde with cement most of the gas escapes through the abscess, which soon yields to the treatment, which should be renewed every three days as long as required. An extended use has shown me the value of this treatment.

Abstracts and Translations.

THE PREPARATION AND COLORING OF LANTERN-SLIDES SUITABLE FOR SCIENTIFIC DEMONSTRATIONS.

BY J. ALFRED SCOTT, M.A., M.D., F.R.C.S.I.¹

As the optical lantern is now used so largely in the illustration of communications made before most societies, I may be pardoned for bringing this subject before you, although it is not strictly a subject connected with dentistry. But as there are some simple methods of preparing suitable slides for this purpose, all of which I use for my own lectures, and which are not generally known, I

¹ Professor of Physiology, Royal College of Surgeons, Ireland.

thought the subject might have sufficient interest for some to warrant my occupying so much of your time.

At the outset I wish to state that I do not intend to speak of the preparation of slides by purely photographic methods, as these are fully described in the photographic manuals and elsewhere, and indeed, from the beautiful specimens in the museum attached to the meeting, I see that many of you have very little to learn.

There are several ways by which fairly good diagrams can be prepared on plain glass. The glass slips, which must be three and a quarter inches square, may be purchased coated with a soft kind of blue paint on which lines may be etched with a needle, but a method I find to be simpler and more easy to work is to cover the plain glass with a thin deposit of carbon from the flame of a small lump of camphor, or a paraffin lamp from which the chimney has been removed and the wick turned low. A thin layer of carbon which is transparent and brown rather than black will be sufficiently opaque, as the deposit appears more opaque in the lantern than it does when held between the eye and a window. On the smoked surface anything can be written or etched with a point; a needle projecting about half an inch from a pen-handle being very satisfactory. The effect on the screen is similar to chalk lines on a black-board. If the slide is to be carried any distance it should be fixed with some varnish; I generally use gum benzoin dissolved in alcohol (about one ounce to the pint) for this purpose. It will soon dry, and can be protected by another glass of the same size fastened by paper strips round the edges.

Two small pieces of paper about one-eighth of an inch in diameter should be fastened on the front, one piece at each of the upper corners, as a guide in putting the slide into the lantern, as it is sometimes very difficult to say which way a slide belonging to another person should be placed when seen for the first time in the very feeble light when the gas is turned down. To repeat, when the writing or drawing is held in the hand, and appears right side up, the two spots should be visible on the upper corners.

Muffed or obscured glass can be purchased cut three and a quarter inches square. Some (the common variety) has a rather coarse grain, some has a very fine grain; this latter should be procured. It is stocked by most photographic dealers. On this surface a hard lead-pencil works very nicely. The glass is sufficiently transparent to enable a drawing previously made on paper or in a book to be traced, but is too opaque for the lantern unless it be varnished. For this purpose a thin solution of Canada balsam

(preferably the dried form used in histology) dissolved in turpentine or xylol can be poured over the muffed surface. It should be dried with a little extra heat, say by holding it before the fire until the glass is warm and testing if it be sticky when cold. This varnish, being nearly of the same refractive index as glass, obliterates the surface, leaving the pencil lines on apparently transparent glass. The slide should then be mounted and "spotted" as described above.

Various colored inks may be easily made, which will write on unprepared glass, by dissolving about ten per cent. of dextrin in a solution of any of the aniline dyes. Eosin and methyl or malachite green are strongly contrasting colors and suitable for this purpose,—they should, however, not be mixed. Indian-ink similarly thickened is very useful for outlines or writing lists of tabulated matter, etc., the lines or principal words being put in with the colored inks. These solutions in dextrin can also be used with a brush either pure or diluted to cover large surfaces on the plain glass.

If the glass be previously coated with a varnish composed of gum dammar ten grains dissolved in one ounce of chloroform with a couple of drops of india-rubber solution to make it less brittle, any ink may be used without the addition of dextrin, should this be inadvisable.

An ordinary lantern plate when cleared with hyposulphite of sodium and washed and dried has a particularly nice surface for writing on with inks, or for coloring with a brush; in this case also dextrin is not necessary.

Ordinary photographs, and especially photographs of book illustrations, can be made much more distinct by being colored or stained. For this purpose it is necessary to have slides which are very transparent and not "fogged" in the portion through which light passes. A "thin" transparency being made apparently more dense by the staining process is often improved more than a denser one. The method consists in painting the various objects in the transparency with a brush charged with a solution of suitable aniline dye dissolved in water. If the gelatin surface of the slide be dry, the lines will be hard and spotty; it should therefore be painted while still damp. The nicest time to work is when the plate has been washed, but before it has become dry. If it has been dried it should be soaked in water for say half an hour. The surface drops of water should then be removed by a clean handkerchief or blotting-paper, and the painting proceeded with.

All aniline dyes will not answer for this purpose, as when they are mixed, in some cases, new chemical bodies are formed which have a very different color from what one would expect. Thus, while some yellows when mixed with blue produce a green color, picric acid when mixed with methylene blue gives a purplish red in the gelatin film.

The colors which I have found most satisfactory in their capabilities of being mixed, and which answer for most purposes even in painting flowers or landscapes, are eosin, chrysoidin, patent tartrazene yellow, and indigo-carmin. With these a great number of combinations of shades can be made with the same facility as an ordinary paint-box.

The gelatin takes the dye very easily,—it is only necessary to slightly tint it,—as the photograph gives the necessary light and shade. The whole operation can thus be carried out very rapidly. These dyes are very much more transparent than any of the varnish colors formerly used, infinitely more easy of application, and practically quite as permanent. To prove this latter I kept a slide colored with a number of dyes, of which one-half of each was covered with black paper, before an arc light for three hours, and while some dyes faded a good deal, the amount in those mentioned above was not noticeable, except in the case of eosin, of which the most delicate tints faded a little, but the stronger tints did not show much fading. Although these dyes undoubtedly fade by prolonged exposure to sunlight, yet the short time that a slide is allowed to remain in the lantern does not affect it at all. Many of my colored slides have been used many times during the last few years, yet appear as when first painted.

In conclusion, I hope that some of these methods will prove useful. They are all easy of application. Those mentioned first, though more or less rough, yet will be found to take the place of the black-board in most cases, which is obviously inconvenient to use when the room has been darkened, and, if there are lantern slides of other sorts to be shown, very troublesome, the lights having to be lowered and raised alternately.—*Journal of the British Dental Association.*

Reports of Society Meetings.

AMERICAN DENTAL ASSOCIATION.

(Continued from Vol. XVIII., page 825.)

August 5, 1897.—Third day.—Morning Session.

THE meeting was called to order at ten o'clock, by the President, Dr. Truman. The Secretary read the minutes of the previous session, which were approved.

Dr. Taft read the report of the Committee on Necrology, as follows:

This Association can certainly in justice do no less than place upon the pages of its records some token of the high esteem and regard with reference to the work of those who have gone from us this year. The memory of each should be cherished by every member of this Association.

FRANK ABBOTT, of New York, suddenly passed away on April 20, 1897, of cardiac disease, in the sixty-first year of his age. He was a native of Maine, and entered on the practice of dentistry at Johnstown, New York, in 1858, where he practised for several years. He went into the Union army during the Civil War of this country, and was finally taken prisoner; he was subsequently released, and returned to his home, resuming practice for a brief time, after which he removed to New York City, where he established a large practice. He was largely instrumental in establishing the New York College of Dental Surgery, in which he served as Dean until the time of his death. Dr. Abbott was one of the very active members of his profession, interested in all things that pertained to its welfare. As an organizer and teacher he had a national reputation. He was a writer of more than ordinary ability. Numerous papers he presented, read before this body, are ample evidence of this fact. He prepared a work entitled "Dental Pathology and Practice," in which the choicest of these productions is presented. He became an active member of this body in July, 1866, and was very active in promoting its best interests. He was

always active in dental society work in his own State. He was a member of the National Association of Dental Faculties, and a member of the Executive Committee of that body. He was enthusiastic in whatever he undertook, and ever ready to give expression to his views; he was kind-hearted, and highly esteemed by all who knew him.

FRANCIS PEABODY was born in Boston in 1833. In his early manhood he removed to Louisville, Ky., where he studied his profession with his uncle, Dr. William H. Goddard, one of the most distinguished dentists of his day. He afterwards took a course of instruction in the Ohio College of Dental Surgery, and graduated. He continued his practice in Louisville until 1871, when he went to Rio Janeiro, where he practised for some time, and afterwards returned to Kentucky, where he remained until his death. He allied himself with dental society work early in his career, and was earnest in his efforts to secure the elevation of the profession. He was an active member of the Southern Dental Association, and of many other similar bodies. He became a member of this body in 1888, and was always interested in the work, being present at its meetings whenever his health would permit. For some years he was connected with the Louisville Dental College, as President of its Faculty and Professor of Operative Dentistry. He was a successful teacher, and did much to build up and strengthen that institution. He was a man of marked ability as a practitioner. He was fruitful in devices and methods, a man of generous disposition, whose friendship every one prized.

Dr. S. B. BROWN, of Fort Wayne, Ind., was born in 1834, in Vermont, and died June 5, 1897. He grew up in agricultural pursuits. After two years of pupilage as a student of dentistry, he began its practice at Ticonderoga, N. Y. In 1885 he removed to Ohio, and in 1896 to Fort Wayne, where he practised until his death. He received the degree of D.D.S. from the Pennsylvania College of Dentistry in March, 1870. He was much interested in all that pertained to his profession; he was a champion of its dignity, ever ready to come to its defense when it was assailed. During the last two or three years of his life he did much to bring his views to the attention of college classes and faculties throughout the country, by addresses and written communications. He became a member of this body in August, 1869, and was usually present at its meetings. He was of a quiet and rather retiring nature, and perhaps exerted more influence upon his professional brethren by

personal contact than by more public efforts. Still, whenever occasion called for it, he was not lacking in the latter. Although he was widely known in professional circles throughout the country, his most marked influence was exerted within the bounds of his own State. He was one of the founders of the Indiana State Dental Society, and occupied its highest positions of trust and honor. He was connected with the Indiana Dental College, either as teacher or member of its Faculty or Board of Trustees nearly all the years of its existence. Who, in Indiana, will fill Dr. Brown's place? He was beloved, and his name will be cherished by all who knew him.

DR. ELI SLAGEL was born in 1836, at Fleetwood, Pa. He began the study of dentistry under Dr. W. W. Thompson, and completed his course of study under Dr. Lukens, of Philadelphia. He allied himself with dental societies in his own State, always helping, so far as he might, towards their welfare. He became an active member of this body in 1896. He added many useful improvements to his art, which were highly prized by those to whom they were given. His bearing commanded the respect of all who came in contact with him, professionally or otherwise.

The death of WILLIAM N. MORRISON occurred at Hot Springs, December 20, 1896. He was born in Ohio in 1842. His whole professional life was spent in St. Louis, where he established an eminently successful practice. In his early life he had to contend against great odds, especially when he came to take up his life work. He was a man of great perseverance and industry. In 1864 he graduated from the Ohio College of Dental Surgery. Throughout his career he kept fully abreast with the progress of his profession. He was the first to devise, use, and present to the profession a number of valuable methods, processes, and materials. His interest in the profession never flagged. He was ever ready to receive that which was valuable from his professional brethren, and always as ready to give anything he possessed that might be serviceable to others. He kept up with the literature of the profession, often contributing to it through the journals. He did much to promote association work; he was a member of a number of dental societies, was often present at their meetings, and at such times was ready to do his share of the work. His life presents an example that will influence many in the profession, especially the younger members. He became a member of this body in 1864, and was its warm supporter until the time of his death. His passing away leaves a vacant place that will not be readily

filled. The profession and this Association cannot afford to lose such members as Dr. Morrison.

Resolved, That the record of this report be placed on a memorial page of the proceedings of this Association; that a copy be sent to the dental journals for publication, and that an engrossed copy be sent to the family of each of the subjects of this report.

(Signed)

THE COMMITTEE.

Report and the resolution therein contained were adopted.

Dr. Taft.—Your Committee feel sad at the preparation of a report of this kind, not only on account of the character of the men who have passed away, but also because there are so many that have gone within the last twelve months. The report seems voluminous. The Committee is impressed with the idea that what has been said should all be said concerning these men. More would have been said had the Committee followed out their inclinations, but it was not proper to make it too lengthy,—simply to touch upon the most salient points.

The President then called for discussion on the paper and exhibition of Dr. Broomell.

Dr. Peirce.—The exhibition I consider was a very successful one, but not one that would call for much discussion. It brought to mind very forcibly the contest of many years ago and recently settled,—the theory of development. I think it may be of interest to give a sketch of the difference between the two theories that were advanced at that time. When Harvey, who originated the theory of the circulation of the blood, had finished that work, and Leeuwenhoek had perfected his microscopic work and placed it before the scientific world, Harvey procured a microscope in 1651, and took it into his laboratory; he also took a hen and twenty-one eggs. Every day an egg was broken and note made of what took place in the ovum. When he completed that investigation, he said, "Syngenesis—already formed—is not true; but epigenesis—to be formed—is true." The clergy and every one told him to keep that to himself and not publish it, and it was buried for one hundred and eight years. In 1759, Frederick Caspar Wolf, of Germany, took the subject up, and said Harvey was right. He went through the same experiments with only one organ—the alimentary canal—and made drawings. Every one then said the

animal was already formed in the egg, but Wolf said it had to be developed. Haller came out with a paper and declared it was rank heresy; that every animal was created in the beginning; and he went so far as to state in his paper that in the ovaries of Mother Eve were two hundred billion perfect human beings, and when those were all born, that will be the end of the human family. Haller published that in opposition to the theory of epigenesis. Wolf for many years fought that theory, and it was not until 1789 that he could get a hearing, and get the physiologists of the day to recognize the truth of Harvey's statement. So, to Harvey first, and to Wolf afterwards, are we indebted for the theory of epigenesis,—that the animal is to be developed and is not already developed, and that is the theory that we had so beautifully illustrated last night with reference to the individual organ. It is surprising to know how recently have we recognized the truth in development. You are all familiar with the custom of the Spaniards in giving their children the mother's name. That idea was doubtless the origin of it. The mother only was the parent of the child; the father's traits and disposition had nothing to do with it. The theory was that the father only stimulated development, and that theory held until 1789.

Regarding the exhibition last night, I do not know that those who witnessed it recognize the fact of how difficult it was to show the development of enamel. We had only the space where that reticulum existed. Dr. Broomell tried to get a photograph of it, but the moment he exposed it it contracted. When you saw the development of the dentine, you saw the open space above the cusps, not the enamel at all. The cusp of the enamel was there, but the reticulum that was instrumental in producing the calcosglobulin, that produced the ameloblasts, could not be shown. We have only the space, and it is very rare that we can get the reticulum that is instrumental in producing the ameloblasts. I know the intense and persistent labor of Dr. Broomell in getting these parts in condition to show them. We have never had an exhibition of the kind, giving us the structure in its entirety; we have had only sections and slides. Dr. Broomell is entitled to great praise and commendation.

Dr. Patterson.—I was greatly interested in the exhibition, and appreciate the labor that Dr. Broomell has gone through. I do not believe myself competent to say anything further on the subject.

Subject passed.

Section VI., Physiology and Etiology, then presented the following report, through Dr. J. D. Patterson, its chairman:

The etiology and physiology of the oral cavity grows in importance with increased dental knowledge, and of the dentist, who is in reality a professional man, more education in this important field is year by year demanded. In the literature which has come to us during the past year in the annual of the "Universal Medical Sciences," Dr. Sajous, editor, we glean the following upon phagocytosis:

"The controversy as to the part played by phagocytes still continues." Metschnikoff is chief, of course, for the phagocytes, and Pfeiffer chief of the opposition. They each have many supporters. Pfeiffer claims that the destructive processes come "through extracellular action, and that the serum alone exerts bactericidal power;" that the dead germs which he, with Metschnikoff, acknowledges are found within phagocytes were dead when they were surrounded or taken in,—killed by the serum.

Connected closely with this question is the one of "immunity" and what part antitoxins play. Buchner (1896) thinks that immunity is not the result of direct action of the antitoxin upon the toxin, but that both act antagonistically upon the cells of the human system.

Kossell looks upon the bacteria-destroying power of nucleinic acid as playing a part in the development of immunity. Metschnikoff agrees with this, because it gives a part to phagocytes in the accession of immunity. Roux likewise looks upon immunity as due to cell activity. Editor Sajous says, "The preponderance of evidence gives nucleinic acid the greater part of immunity. The question, however, as to whether the acid acts exclusively as a bacteria-destroying agent, or if by its acidity it neutralizes the toxins, remains unsettled."

In the "New Surgery," issued since our last meeting, edited by Dr. Roswell Park, we find on page 312 the following of interest to the dental surgeon: "The study of the bacteria of the mouth is of great interest to the surgeon. The relationship between mouth bacteria and local lesions of the teeth and jaws and mucous membranes—of secondary gastric disturbances—and the study of the mouth as the first point of infection for both local and general diseases is a wide subject. Suffice it to say that normally the mouth contains scores of varieties of bacteria,—saprogenic usually,—but include also common pathogenic forms, which may be found as normal inhabitants of the mouth without injury to the individual;

but if the vitality of the tissues is lowered to a sufficient degree, these pathogenic germs may find a favorable breeding-ground for the production of disease. The mouth furnishes a point of infection for most pathogenic germs,—e.g., those of diphtheria, erysipelas, actinomycosis,—the *oidium albicans* of thrush,—tubercle bacilli, and the virus of syphilis."

In the literature which has appeared since our last meeting, one year ago, bearing upon the subjects of this section, we note an essay upon the "Experimental Study of the Different Modes of Protecting the Oral Cavity against Pathogenic Bacteria," by A. C. Hugenschmidt, M.D., D.D.S., of France (*Cosmos*, October, 1896). An interesting statement in this essay is that after certain oral operations, such as the extraction of a tooth, the soft parts of the injured territory often present the appearance of an ugly wound, and when we think of the pathogenic germs often found in the mouth, it is difficult to understand why such an exposed wound is not more often the seat of severe local trouble, or that it does not bring on a general infection of the economy. There is no doubt that the severe local inflammations which sometimes arise are due to this infection, and the operator should take all precautions. Usually, the phagocytes and the chemotactic and mechanical properties of the oral fluids prevent injury.

We note an article upon "Diseases of the Oral Cavity a Potent Factor in General Diseases," by Dr. S. W. Foster, Atlanta, Georgia, read before the Dental Section of the American Medical Association, 1897, and published in the *Dental Cosmos*, in which the author names the following dental irritations as productive of general diseases:

First, dentition; impacted teeth causing obscure neuroses; destruction of masticating power causing dyspepsia and gastritis; general lack of oral hygiene, which poisons nutrition, causing nervous debility and breaking down of the vital forces; also consumption. Of this last the author says, "It is rare that we see a consumptive in whom we do not find a typical case of pyorrhœa, or at least pus exuding from and around the necks of the teeth, and it seems that the breathing into the lungs of the effluvia from these suppurating sinuses of the mouth might produce this fatal disease."

We note a paper upon the "Etiology of Fetor ex Ore," by Dr. Jerome Allen (M.D., D.D.S.), in which especial attention is called to the fact that the most persistent and lasting fetors are due to the chronic and exudative diseases of the gums, bones, and mucous surfaces. This, we think, will be appreciated by those having pyorrhœa under treatment.

In the INTERNATIONAL DENTAL JOURNAL, December, 1896, is noted an article by William H. Trueman, entitled "Pyorrhœa from a New Stand-Point." In regard to etiology, the author strongly inclines to the belief that the disease is a germ infection.

We note a paper upon "Pyorrhœa Alveolaris," by Dr. George B. Clement, Macon, Miss. Dr. Clement claims that the disease is caused by hypercalcic deposit in the cementum from the cells which form that structure.

In "Pyorrhœa Alveolaris," by Joseph T. Wassell, M.D., D.D.S., of Chicago (*Dental Review*, June, 1897), the writer speaks of its etiology, and suggests a constitutional disorder found in eczema which he believes has an important relation to the affection.

In Roswell Park's "New Surgery" is found the following: "Stomatitis catarrhalis is a simple catarrhal condition resulting from irritation of the mucous membrane from mechanical, chemical, or mycotic causes. It presents the symptoms of desquamating catarrhal condition."

A paper upon "Pyorrhœa Alveolaris," by J. E. Cravens, D.D.S., Indianapolis (*Dental Digest*, August, 1896).

A criticism of the uric acid theory of pyorrhœa, entitled "Peculiar Pathological Perceptions," by J. D. Patterson, D.D.S. (*Dental Review*, March, 1897).

We further note an essay upon "Stomatitis the Cause of Various Throat Diseases," by Isidore Lett, D.D.S., Philadelphia (*Dental Cosmos*, September, 1896).

In the INTERNATIONAL DENTAL JOURNAL we find an essay upon "Nasal Obstructions which result in Mouth Breathing, with Special Reference to Adenoid Vegetations," by George L. Richards, M.D., Boston. The writer has the following to say upon the etiology of nasal obstructions: "The cause is not very clear; heredity and climate, especially the latter, seems to play a part, as they are found more frequently in the North and on the coast than inland, and to the South scrofula, measles, scarlet fever, and whooping-cough are causative."

An essay upon "Salivary Calculi," by Gustav Fütterer, M.D. (INTERNATIONAL DENTAL JOURNAL), in regard to causation; the author gives proof that in a majority of cases the disease arises from calcic matter being deposited in the ducts. He says, "Small pieces of tartar often break down, and can very easily enter the ducts, especially Wharton's duct, and here we find the most calculi, which are very rare occurrences in Steno's duct. Gravitation will bring the disease down to the bottom of the mouth rather than up

to Steno's duct. They will remain there longer, and occasion to enter will offer itself more readily. The same rule holds good in animals." The theory that the uric acid diathesis is causative of the deposits is discouraged by the author.

In the *Dental Cosmos* of February, 1897, appears an article by Dr. M. H. Cryer (M.D., D.D.S.) upon "The Contributions of Dentists to Surgery."

"The Relation of the Teeth to the Ear, Nose, and Antrum," by O. F. Gambati, M.D., Houston, Texas. The particular phase of thought found in this paper may be said to be in the claim that an empyemic condition of the antrum sets up a pathological condition of the teeth.

In the *Practitioner and Advertiser*, July, 1897, the editor, W. C. Barrett, in speaking of the etiology of "Diseases of the Maxillary Sinus," says renewed attention has been directed to the fact that a diseased condition of the frontal and other sinuses is sometimes present, thus preventing diseases supposed to be wholly in the antrum. When the case is obstinate, it is recommended that other cavities which may drain into the maxillary sinus should be exposed."

In the *Dental Cosmos* of February, 1897, James S. Williams, M.D., D.D.S., relates a case of "Herpes Zoster, associated with Dental Trauma," in which the eczema appeared upon the left temple and involved the eye, caused by a diseased left superior cuspid, and which trouble disappeared upon the extraction of the tooth.

"Cancer of the Lip," by C. L. Gibson, M.D., New York City (*Dental Cosmos*, June, 1897). The causation of this disease is analyzed as follows: "As regards the cause of this disease, to traumatism in general is ascribed the chief place. The lips are easily abraded, cracked, chapped, burnt, and otherwise maltreated, so that abundant sources of irritation are furnished." As regards the element of heredity, there is an ever-increasing tendency to belittle its importance. It is undoubtedly true that the belief in heredity, so strong until recent years, was based to a great extent on tradition. The strong efforts which we are all making to place medicine upon the plane of an exact science discourages the acceptance of vague theories and histories concerning cancerous relationship, and, subjected to an exact scrutiny, the family history of cancer is reduced to so small an extent as to be looked upon only as an interesting coincidence. The author also points out that it is startling to see how many cases of lip cancer have been "acquired by living in dwellings previously occupied by the subjects of cancer."

"Dentistry and its Relation to Medicine" is the subject of a paper by Archibald Dunn, M.D., in the *Dental Practitioner and Advertiser*, April, 1897, in which the author cites two recent cases in his practice, one in which hemicrania was caused by an obscure cavity in the buccal surface of a superior third molar, and one in which convulsions and epilepsy had causation in a filled lower molar.

Dr. Patterson further reported that the officers of the Section have tried to secure papers in addition to the report of the chairman, but have been unsuccessful.

Section VII., Anatomy, Pathology, and Surgery.

Dr. Barrett.—I would say that I have not the written report with me at present, but will send it in later to be published in the transactions. The first part of the report refers to the subject of anatomy. It has been urged that there is nothing new to present, because there have been no material changes in the anatomy of the human body within the past generation or two; but there has been a vast change in our comprehension of the human anatomy. Dr. Cryer, two years ago, exhibited specimens, and he showed that the profession in the past and the writers and authors on anatomy have been in error; that they have not the truth of the matter, and that the infundibulum was really in many cases opening into the antrum itself, and hence degeneration might take place in the frontal sinus, and the pus discharged from that might ooze down and become a source of irritation in the antrum. Hence, in trouble of the antrum it would be almost impossible to diagnose it clearly.

There is another point in anatomy which I think is of importance to us, and that is this: Books on the subject represent the pulp of the tooth, the nervous supply of the pulp, as having been received from the internal dental artery. I believe that to be a positive error. The proof that this is not the case lies here: that no continuation of the artery or nerve can be traced beyond the pericementum, and it seems to me that the pericementum is the central organ which supplies the pulp; that the foramen of a tooth is a delta, spreading out, dipping down, and uniting with the pericementum from which it receives its supply.

It has been a question how and when it was possible to cap a pulp successfully. I believe that to be solved by this one fact in anatomy. There are no lymphatics within the pulp to take up any matter that shall have passed off. As in the brain, because of the change of the character of the blood-vessels and the lack of absorption, so in the pulp, which is surrounded by the tooth itself,

as the brain is surrounded by the walls of the cranium ; there are no more absorbents in the dental pulp than in the brain. That gives us a diagnostic sign beyond which it is imprudent to proceed. There is no connection between the pulp and the internal artery for the blood-supply.

I would refer to some new operations by Dr. Brophy for congenital cleft palate, the operation to be performed at the earliest possible moment after birth. The strangest thing is that when you bring these two parts together there goes on development. It seems to develop as perfectly as any other.

We cannot call ourselves scientists as long as we pay no attention to any part of the body except that which we cultivate for our own special benefit. It is our business to study the various relations of the teeth to the other portions of the body. What shall we have to answer if another part of the scientific world steps in and occupies that place for itself? I have secured the co-operation of Ward's Natural Science Museum, at Rochester, and early in the year they commenced to gather together material for exhibition here. The exhibition is offered for sale, and is intended to be sold as a whole ; it should not be separated. It should go to some college.

The Section desires to present the following papers :

"Report of a Case in Practice: Operation for the Opening of the Frontal Sinus and Infundibulum," by Professor Truman W. Brophy.

"Further Studies of the Relation of the Frontal Sinus to the Antrum," by Professor Thomas W. Fillebrown.

"Structural Development," by Professor C. N. Peirce.

Also a volunteer paper by Charles H. Ward, entitled "The Teeth as a Factor in Anthropology."

The Committee desires to present the catalogue of the collection, which it has had printed. It makes a pamphlet of thirty-two pages, although we tried to condense it as much as possible. We suggest that it would be well to publish this catalogue in connection with the report, that the world may comprehend something of what the American Dental Association is doing.

Dr. Taft moved that all the papers be heard without discussion, unless there should be time to discuss the same.

Motion carried.

Dr. Brophy and Dr. Peirce then read their papers, after which Mr. Ward's paper and that of Dr. Fillebrown were read by title only. Section passed.

Section I., Prosthetic Dentistry, Chemistry, and Metallurgy.

Dr. Waters reports that there is one paper, the title of which is "Opening the Bite with Cap-Fillings, Preserving the Vitality of the Pulp," by Dr. M. F. Finlay.

Dr. Finlay then read his paper, as follows:

The patient, male, aged sixty-two years; every tooth present in upper jaw, and all in regular position, with the exception of left cuspid, which closed inside its opponent of the lower jaw; the four incisors were very much worn, so that the palatine surface presented a straight line or inclined plane from labio-incisive edge to palato-gingival line. These same incisors when jaws were closed came in contact with and pressed upon the lower gums. The bicuspid and molars of the left side showed effect of mechanical abrasion, and the outer cusps lapping pretty well over the outer or buccal side of the lower teeth opposite, the bicuspid and molars of the right side showing scarcely at all. On the lower jaw, the first and second molars, right side, were lost, accounting for the last-mentioned condition of the upper jaw, at the same time throwing the work of mastication almost entirely upon the left side of the mouth, and in consequence causing the wear spoken of on the teeth of that side on the upper jaw, the lower teeth suffering more loss of tissue than the upper ones, and they also being, as it were, driven down into their sockets from the undue pressure, as appears in the model.

The lower incisors were worn to an inclined plane, presenting a surface opposite that of the upper incisors,—the plane running from the palato-incisive edge to the labio-gingival line, and the incisive edges impinging on the upper gums when teeth were closed. My belief is that quite a good deal of responsibility for the excessive wear of the teeth, and the depressed condition of the lower teeth, left side, is due to the malposition of the left upper cuspid, one of the main abutments of the arch being so misplaced as to offer no resistance to the settling together of the two jaws, whereas if the cuspid had been in its normal position, or had been forced there by regulating at the proper age, it would have been quite impossible for such a condition to have attained. The contact of the front teeth with the gums opposite in closing the mouth, and the close proximity of the outer cusps of the upper molars of the left side with the gums of the lower jaw, forcing the food in the process of mastication in painful contact with said gums, caused the patient so much discomfort that he sought relief, or at least advice, as to what might be done to the best advantage to obtain the same.

After taking impressions and getting models, my first thought or inspiration was to open the bite with cast or struck-up slabs of metal or cap-fillings, as I have decided to designate them. How to attach the cap-filling was the question to be solved. In consulting several of my brother practitioners, all at first seemed to oppose my plan as not being at all feasible. First thoughts or impressions are the most lasting, and there was no exception to the rule in this instance, as I persisted in my belief that a way could be found to attach these cap-fillings which would be satisfactory alike to patient and operator.

My reason for not crowning the teeth, as was advised by some, was that too much tooth-structure would have been sacrificed upon the approximal surfaces in preparing for such a procedure to satisfy my conscience. The teeth were not decayed or darkened, but were worn down; also all the teeth had living pulps, and I was afraid to disturb the relation of the gums to the necks of the teeth as much as would have been required to place crowns over three adjoining teeth, with no tooth missing to afford easy access to any of the surfaces to be cut away.

Now for my plan of procedure: The second bicuspid and the first and second molars on the left side, lower jaw, were restored or built up with these cap-fillings, and the second bicuspid and third molar on the right side, lower jaw, were crowned to carry a bridge to replace the lost first and second molars, the occlusion raised to correspond with the open bite.

In preparation for these cap-fillings, the occlusal surfaces of the teeth to be capped were ground, so as to make them nearly a plane, although not absolutely so; then, taking an impression in moldine and making die and counter with Melotte's metal, I struck up pieces of nearly pure gold about 32-gauge, to fit these ground surfaces, and drilled four holes in the molars and three in the bicuspids, punching holes in the little pieces of gold to correspond in position and soldering platinum pins in them, and then united to them cusps struck up on a die plate, and filled those, making a cap of considerable thickness.

I ought also to say that the first piece of gold stamped to fit the tooth was thickened up, a second piece stamped over the first and united to the first before the pins were soldered in. Twenty-carat solder was used in fastening the pins and filling the cusps, and the two pieces united with eighteen-carat solder.

As to the location of the pin-holes in the molars, I drilled them at a safe distance from the margins of the occlusal surfaces of the

tooth in the centre of the four sides, by this means avoiding the cusps, and thereby also the cornea of the pulp, for, as above stated, all the teeth had living pulps.

As a result of my labors, the second bicuspid and first and second molars of the left side, lower jaw, were raised with cap-fillings, the approximal surfaces of the teeth not being disturbed in their relations one with the other, and the second bicuspid and third molar of the right side made to carry an all-gold bridge, thus raising the bite and restoring the lost masticating surfaces, preventing contact of the front teeth with the gums, and opening the bite sufficiently to prevent pain during mastication. The cap-fillings were fastened with cement, as was also the bridge, and all set at the same time, so as to avoid irritation by pressure on a single tooth or one side of the jaw.

As an incident in connection with the construction of the bridge, when working on the third molar, the patient related his experience in having had a gold filling put in on the buccal surface of this tooth by one of our late esteemed friends in New York City, which required more than a year in the preparation of the cavity and insertion of the filling, and for which he paid two hundred and fifty dollars. Since that occasion he said he had often wondered for what purpose he had preserved this third molar, as it was really of not much use to him, the two teeth in front of it having been lost, but now he realized why it had been preserved to advantage, because it enabled him to have this bridge put in, using the tooth as one of the abutments.

Dr. Finlay presented with the paper models and photographs of the case.

DISCUSSION.

Dr. Peirce.—I want to make allusion to one item touched upon, and that is the matter of tartar or salivary calculus. I think the dental profession has been quite lax in expressing that properly. Nearly every teacher has spoken of it as an amorphous deposit. It has been my fortune to make a number of experiments in the past year trying to ascertain whether the tartar upon the teeth was simply a precipitate of the lime in the saliva, or whether its deposition was due to organisms in the saliva. A quantity of saliva placed in a vessel outside of the mouth, although it may be saturated with lime, will not deposit that lime in the vessel, but if we can place in the saliva organisms such as the leptothrix, I am satisfied we can get a deposit on the sides or bottom of the vessel.

I believe the deposition of lime upon the teeth is due not only to the fact, which is essential, that there must be lime in the saliva, but also to the fact that we have organisms which are instrumental in its deposition. I took two patients, in whose mouths there was a rapid and profuse deposition of tartar upon the teeth. I asked them to keep their mouths as pure as possible with a strong antiseptic for a limited time. The care exercised in washing that mouth or keeping it saturated with a strong antiseptic without interfering at all with the natural secretion of the saliva from the glands prevented the deposition of calculus on the teeth. That satisfied me that the deposition was not only due to the presence of lime in the mouth, but also to the organisms in the mouth.

Professor McQuillan prepared a paper on the subject of tartar in the mouth being a result of some organism, but he did not sustain his theory, because he could not discover that organism. Microscopic investigation did not discover anything akin to the coral organism. If any gentleman here will take a patient from whose mouth he is in the habit of removing tartar, and have the patient use a strong antiseptic, the tartar deposited will be found to be of a minimum quantity. I use boracic acid and gaultheria. It destroys the micro-organisms, and prevents them from depositing tartar on the teeth. Salivary calculus is due to an organism as well as the lime in the saliva.

Dr. Barrett.—I cannot agree with Dr. Peirce, for two or three reasons. How can a micro-organism produce any kind of deposit or any kind of change? Precisely as a potato decomposes the ground in which it is, so the micro-organism decomposes the medium in which it grows and excludes certain of the atoms of oxygen or carbon, taking out whatever it wants for its own organism; these excluded organisms make new organisms and produce the characteristic by-product. That may be a ptomaine of such exceeding power and strength that we have scarcely any conception. Take a single ptomaine and compare it with any of our poisons. One-millionth of a grain is poisonous in the bacillus of tetanus. This is always, so far as I know, in the presence of organic matter. The coral is referred to, but it is built up in inorganic matter; that changes the relation. The change that takes place is utterly different in calcic material from that which takes place in inorganic matter. In the presence of albumen, calcic matter assumes a definite, concentrated form, and it becomes the calcoglobulin of the salts of the tooth. In inorganic matter it is different. We have the carbon dioxide of the breath meeting the saliva, which con-

tains the lime, and in its presence there is an amorphous precipitate, and so the tartar is amorphous in its character.

Dr. Taft.—This is a new thought to some, in regard to the action of organisms in the precipitation of calcareous material upon the tooth. When the saliva passes out of the salivary ducts its environment is changed. Its temperature is lower, perhaps, especially if the mouth is kept open. It comes in contact and is mixed with the mucus of the mouth, which changes its chemical character, and it is in contact with the atmosphere, and probably absorbs oxygen from it. This is supposed to be sufficient to cause a precipitation or a dropping down of the calcareous material in the saliva, which has been held in solution. When it comes into the mouth and passes out into the ducts and oral cavity, the conditions and environments are so changed that it is no longer able to hold this material in solution, and it is precipitated. Saliva contains carbonic acid gas, and that is neutralized after the fluid passes into the mouth. This is an important factor in the retention of lime salts in solution. In vessels in which lime-water is boiled you find that rapid precipitation takes place. The precipitation in the mouth is not very rapid; it requires weeks, months, and sometimes years, to produce any considerable accumulation. Usually it takes months, although there are exceptional cases, of course. The more dense varieties require a long time for the precipitation. Dr. Peirce referred to the use of antiseptic agents in the mouth to minimize or destroy this action. The material is used principally with a brush, is it not?

Dr. Peirce.—No; usually as a wash in the mouth.

Dr. Taft.—May not that agent which you have used so change the saliva as to reduce its solvent power upon this material, and it therefore lets go of the material which is held in solution, and that is thrown down? A large share which is precipitated in the mouth does not lodge on the teeth, but only in those places where there is no friction, or action, to keep it away and get rid of it. It had not occurred to me that organisms play any part in this matter, but we would do well to investigate it.

Dr. Patterson.—The matter of the calcic deposits was not brought up in the report at all in this way. I would hesitate for a long time in believing in the theory put forth by Dr. Peirce. I think he starts upon a proposition which is totally wrong, that in the solution containing these inorganic materials we will not find a precipitate. There is not a winter passes that I do not make the experiment right before the class to which I lecture in our college.

I have made that experiment so many times and found the deposit on the rods which I place in the solution that I think he is on the wrong basis.

As to the micro-organisms, I do not see how that is possible, except on account of their presence, not on account of any of their products.

The subject of etiology is a very interesting one to me, and I have been discouraged, in trying to make this report, that I have not secured the assistance from those to whom I appealed. It was a very interesting question to me, especially on account of some local experience we have had. There have been six suits for malpractice against dentists in the State of Kansas. Only last week one of my friends was mulcted in the sum of six thousand dollars. The question that the jury had to determine was, what caused the trouble in the jaw, resulting in the loss of teeth and the loss of process? The damage in one case was given on account of the belief that the hypodermic needle which was used for anæsthetizing the parts was infected. The question went over the various theories, from physicians to dentists, in regard to the etiology of the trouble. It has been very interesting to me, but I do not know what we will do if ignorant juries are to decide upon what causes certain trouble and certain results.

Subject passed.

Dr. Patterson.—The Auditing Committee report that they find the accounts of the Dental Protective Association correct.

Dr. Fillebrown.—As the result of conference with many members of the Southern Dental Association, they are desirous that we meet with them in the pavilion of the Hygeia Hotel, so the Committee has consented to a change in the programme in regard to meeting there instead of here.

Adjournment.

August 5, 1897.—Third Day.—Evening Session.

The meeting was called to order at half-past eight by the President, Dr. Truman.

The minutes of the previous session were read and approved.

Dr. Peirce.—Under the head of miscellaneous business, the Executive Committee has a few things to present. The supposition at the present time is that the American Dental Association will terminate its present existence with this session. If so, we need to make provision for the publication of our transactions. Shall the

transactions be referred to the Publication Committee, with authority to publish them, as previously?

Dr. Smith moved that the transactions be referred to the Publication Committee and published, as usual.

Carried.

The second item is that the Secretary has on hand a number of copies of the late transactions. Shall they be given to the members, or shall an effort be made to preserve more than the specified number? Some years ago a motion was made that the Secretary retain in his possession ten copies of each publication. I understand the Secretary has many more than that on hand. Shall those ten from each publication be kept for the benefit of the members of this Association? It seems to me desirable that we shall keep on hand a limited number of our publications, because in the future there may be some demand for them as a matter of history.

Dr. Donnelly.—The National Museum at Washington will take care of anything of that kind in any way you desire. If you want them preserved without being used, there is storage room for them; if you want them put on the shelves, they will be placed there for reference by dental students; if you want them given to libraries or exchanged with other societies, correspondence to that effect will be opened at once.

Dr. Peirce.—I move that those copies be given in charge of the Army Museum and Library in Washington, and that an order be drawn on the Treasurer for the expense of placing them in that position.

Dr. Fillebrown.—I had the pleasure of meeting Dr. Huntington, who is connected with that Museum, on my trip here. I think no better disposition can be made of our proceedings than to send the copies there and let them use them for the best interests of the world at large.

Dr. Peirce.—I would move also that the very valuable book now in our possession be disposed of in the same way,—the old book which contains the names of the founders of this Association. It should be rebound and placed where it can be protected for all time. I should add to that list the names of all the present members, together with the date of their coming into the society, as a matter of history and record. It would be some little expense, but our treasury can afford it.

Both motions carried.

Another matter is as to the funds of this Association. Provision was made this afternoon, before the new association, that we should

pay into the new association a certain sum of money,—equal to one dollar for each active member of this society. We will still have on hand fifteen hundred dollars or more, and it is for this body to state what disposition shall be made of this fund. The question is also raised, Shall we pass a resolution to disband this Association after the present session is through?

The President.—We are disposing of money and everything,—making our will, as it were. I think the first real business would be to decide what shall be done with the Association.

Dr. Crouse.—I do not think many members understand this matter, and I move that at the adjournment of this Association to-morrow we adjourn *sine die*, except such work as is necessary to be completed by the officers to close up the Association's affairs.

Dr. Crawford.—From what has been said, it occurred to me that it would be the proper thing to publish the transactions of the two societies together,—the American Dental Association coming first and the Southern Dental Association last,—so as to put in one volume an authenticated historic account of what has been done.

President Truman left the chair to speak from the floor.

Dr. Truman.—As I understand this proposition, we are to form three organizations, at least, in the United States. The Southern Dental Association propose to hold their organization as one of the branches. The Pacific Coast Congress expect to make that a branch. Why is it necessary that this American Dental Association, fully organized, with all the necessary accompaniments of an association, should disband? It strikes me that we should retain the name of the American Dental Association, Eastern Branch, and continue our work. We must reorganize a branch in the East if we do not. Why should we throw all this away? It seems to me a very loose way to do, and I cannot comprehend it. I left the chair reluctantly, because no one seemed to have that idea. I hope that will be considered before we plunge into obscurity. If the Southern Dental Association propose to keep their association going, why should we disband and be swallowed up entirely in that national organization? I do not feel that that is the correct thing to do.

Dr. Taft.—Speaking of the publication of the proceedings, it strikes me that the proceedings of this body might be published, following them with the proceedings of the Southern Dental Association, and then follow those two with the proceedings of the joint

body; then we would have them altogether. I suppose the proposition in mind, when this organization was effected, was that the American Dental Association and the Southern Dental Association would pass out of existence; there would be no longer any occasion for them. That was the feeling I had, and the sooner the idea of continuing them is abandoned the better. I see no occasion for these bodies remaining any longer. The Southern Dental Association had some little work to do, which they intend to accomplish within a year or two, to which, of course, there is no objection; but I do not know what work the American Dental Association has to do. If you continue this, you simply make another organization instead of uniting and consolidating the profession into one association that shall be far more out-reaching than either of these could be separately.

Dr. Truman.—Was it not suggested that there should be an Eastern branch formed?

Dr. Taft.—It was suggested to have branches, but here is a point, What shall be the mode of operation of these branches? This consolidated body will meet one year at one district, the next year in another, and the next year in the other. It is intended to be an annual meeting.

Dr. Truman resumed the chair.

Dr. Taft.—I heard these resolutions and rules read twice, and endeavored to follow them, and the idea I obtained was just as I have stated,—that there would be a consolidated body and that this Association would pass out of existence, and that the same would be true in regard to the Southern Dental Association. I consider that it would bring the forces of the profession all together and make the work more efficient, bringing the people of the different sections of the country together in unity, harmony, and accord for the promotion of the profession. If you will have three or four different sections all over the country, what will be accomplished?

Dr. Fillebrown.—Our movement in making a new association does not, in any practical sense, obliterate this Association. It is simply a change of name. These same men, with an enlarged membership, meet next year exactly on the same relations to the country that this Association does to-day. Why should the American Dental Association lose its name and the Southern Dental Association not its name? The Southern Dental Association is a local organization, and its membership does not extend beyond the limit of the Southern States. The American Dental Association is

a national association. There are to-day forty-seven members in the South belonging to the American Dental Association; that is more than there are in the West. We are simply changing our name and going ahead. The Southern Dental Association is already organized as a profitable branch. I think branches will exist. They have existed in the British Medical Association and the British Dental Association for many years, and profitably, and probably will continue so. The Southern branch will meet perhaps next year in Florida and hold a meeting; then the members will come and meet with the National Association in the summer. I hope I can relieve our President of his apprehension that we are dying out. I hope this resolution will prevail. I like the idea of Dr. Taft, that we publish our proceedings in the same book, and that they shall be interchanged. I think it would be a very nice thing, and in it all the proceedings of the new body could be published.

Dr. Taft.—The idea of endeavoring to copy after the British procedure is hardly possible. Why should not all the State societies be branches and send delegates to the Association?

Dr. Donnelly.—If I understand Dr. Truman's point, it is a very good one. This country has been divided into three sections. In one section the machinery is already in operation for the organization that is to represent that section. In the West there is the Pacific Coast Association, where the machinery is also in operation, and will continue under the same name. This Association has, to a large extent, been an Eastern association, not in the sense that it is not American, but in the sense that the men composing its membership are mainly from the East. That section is left without an organization, and without the machinery to put it in motion, and Dr. Truman's suggestion seems to be a good one, in that he calls our attention to the fact that there must be an organization for that section started anew. Why not use the machinery that we have and keep it in motion to form an organization to represent that section?

Dr. Patterson.—It seems to me the whole intent of the consolidation would be frustrated if we continue the American Dental Association. If we keep up ours and the Southern Dental Association theirs, we would be only forming another organization.

Resolution carried.

Dr. H. A. Smith.—I just want to call attention to the fact that this is a national body, and it would be in bad taste to maintain this organization with its present name.

Dr. Peirce.—The officers now have authority to transact all the business essential to the closing of this organization and to pay all bills pertaining thereto. The question now comes, What shall be the disposition of the funds remaining on hand after all has been accomplished that is authorized in the resolution adopted this evening?

Dr. Crouse.—I have had my eye on the funds that would be left over in this Association for some time. The members of the Dental Protective Association know that without assessing the members I have a debt on my hands to pay. To my mind, the proper thing for this Association to do is to donate this money and transfer it to the Dental Protective Association to help pay that debt. I can save the Protective Association one thousand dollars if I get enough money together to pay our attorneys. I have hoped the membership would be increased or some way would be found to pay the debt. I can, of course, sell off our securities and pay the debt, but everybody says we must not let the Association go down. I have asked for donations from the members, and have received one thousand eight hundred and twenty-nine dollars altogether to pay an indebtedness of several thousand dollars.

Dr. Fillebrown.—I move that any residue of funds of this Association, left after discharging all of its obligations, shall be turned over to the Dental Protective Association.

Motion carried.

Dr. Fillebrown.—I move that the Treasurer of this Association pay into the treasury of the National Association an amount equivalent to one dollar for each permanent member of this Association.

Motion carried.

Dr. Donnelly read the report of the Committee on Library, and the resolution accompanying the same was adopted.

Dr. Donnelly.—I do not want to have to go to a man and urge anything of this kind on him. If it does not strike him so as to enlist his sympathy and his enthusiasm and his strong moral support, I do not want to see the work attempted at all. I have for years had this matter before me constantly, and that resolution embodies an idea that I had when the matter was first spoken of, that the dental profession is not represented in any part of the government. There we can put a man whose life may be devoted exclusively to the subject,—some good all-around man, at such a salary as they pay medical men who do similar work for the medical profession. It requires endorsement, however. *Dr. Fillebrown* urges us to go ahead, without asking you to speak on the subject.

Since he met one of the gentlemen connected with that department he has exhibited more interest in the matter than he ever had before; and if you were all to put yourselves in touch with the matter, much more would be accomplished through that institution.

Dr. Truman.—Does the government propose to pay the salary of such a man as you mention?

Dr. Donnelly.—The Committee is of the opinion that it can secure the employment of a suitable person at the expense of the government, at such a salary as they pay to men who do like work for the medical profession. This Association has endorsed the Museum as its national museum. Whatever is done now is done in the name of the American Dental Association, unless the National Dental Association takes it up also. We have gone so far, and this Association should have the credit of continuing the scheme to a definite end.

Section II., Dental Education, Literature, and Nomenclature.

Dr. Ottofy.—The Section desires to file its report without reading same. The portion on nomenclature has been prepared by Dr. Guilford.

Report received and referred to the Publication Committee.

Section III., Operative Dentistry.

Dr. Crouse.—The only work has been on the subject of amalgam and its treatment. Before coming here I had the Secretary write to the officers of the sections that if they would procure me specimens of the different amalgams in use we would make practical tests here. We got about eighteen or twenty samples of amalgam. The work is necessarily incomplete, as we worked only two days on it, and some of the amalgams require a longer time to show what their movements would be. I thought I would take the responsibility of showing something of what we are doing without giving the results in detail. It is a question whether this work is developed far enough for the section to recommend the publication of the makes of amalgam tested. They are not very favorable, although the experiments have hardly gone on far enough to know exactly what they will do. I have prepared a short paper in connection with these investigations, illustrating somewhat the line of work that I have been doing. The steel tubes which I will pass around are all of the same size and shape. The amalgam is packed into them, and a little steel button placed in there before the amalgam is hardened, and then a reading taken on the micrometer. I have watched it by the hour, because the action has been so

strange and so fascinating to me. I have here Dr. Black's dynamometer, also Dr. Wedelstaedt's. This instrument we used for testing the strength of the blocks, that is, how much stress they bear before they break to pieces; also to put blocks under this metal instrument, and, placing sixty pounds pressure on them, let them stand and see what the flow was. The question of flow is not much understood. It means the changing of the form of the mass, not breaking it, but bending it or changing it gradually under a sixty pounds pressure. Many of the amalgams showed that they are absolutely worthless where any force comes on them. I have several dies, and I have different operators make blocks with the same amalgams, and I have never found an operator that worked uniformly. They mix their own amalgams and mix them as they please. The working of amalgam is also an important item which we do not understand. It is a great wrong to the dental profession not to have the best amalgam and some form of testing it.

Dr. Crouse then read his paper, entitled "The Amalgam Question," as follows:

The exact date when a combination of different metals reduced to a plastic state with mercury was first used as a filling-material in decayed teeth is not known to the writer; but the fact that amalgam has been a subject of constant dispute for the last thirty-five years, and that frequently during this time these controversies have been so vigorous as to destroy personal friendship and rupture the harmony of dental associations, and the additional fact that the questions under dispute are not settled, is sufficient proof that there are elements of uncertainty about amalgam and its use in dentistry which are more than trivial.

My use of amalgam has been very limited, on account of the unfavorable results from its use by all classes of operators. Whether performed thoroughly or in the most careless manner, the fillings of amalgam in the mouths of the human family are far from satisfactory. The fact that the ravages of decay in many mouths continue and make fresh attacks beyond good fillings, where the tooth substance is left exposed, and the causes which induce decay in the first instance are still present, prevents good fillings and good filling-material from being distinguished from poor and imperfect fillings and worthless materials. Even good gold fillings in unfavorable conditions often fail to accomplish what was expected, and this fact prevents a complete detection of careless and imperfect operations when this one reliable material is used.

From this line of reasoning, what is the stimulus to encourage the best efforts when using what ranks as a second best filling-material employed by the dental profession, when out of sixty-odd different preparations of alloy accurately tested not one met all the requirements for a good filling-material? These faults and defects have always been known to exist, and efforts have been made to detect which one of the great number of amalgams offered for our use was the least objectionable, or, stating it in another way, which are the best offered. Filling cavities in ivory tooth-brush-handles, glass tubes, etc., and then immersing in some colored fluid which would indicate the leakage, and various other tests have been employed; but we are indebted to Dr. Black for the first scientific method of testing amalgam; by the invention of a micrometer and dynometer he was able to take accurate measurements and discover something of what occurred after amalgam was mixed and placed in cavities, and determine scientifically their value; also, to some extent, what changes took place in amalgam, fresh-cut, and after it had been what is known as "aged." The dental profession is indebted to this scientific investigator for many valuable facts brought out and many fallacies corrected, but we feel justified in the statement that the profession owes him a debt of gratitude for this work more than any other.

While I have been able to confirm many facts brought out by Dr. Black, it is not my intention to review what he has done, as it has already been published; but rather to supplement, and with familiar instruments to take up other lines of work which are much needed:

First. To make tests of amalgams now in general use, and give the results to such as are entitled to them. This I trust will prove beneficial not only to us but to our patients as well.

Second. To show by the same aids that we do not know how to use amalgam when a good one is furnished; and I hope thereby to get more thought and skill developed in its use. I have gone far enough in this work to make a radical statement,—namely, that the manufacturers are putting together metals without the necessary equipment or the essential knowledge of the laws of metals and their relation to each other. At any rate, I will agree to prove that the amalgams on the market, as a rule, are unreliable and not uniform, lacking the essential qualities for a good filling-material. The study of the question has so absorbed my thoughts and roused my energies that I can no longer hold them in check. Let me present the picture to your view. A profession that boasts of its accurate attainments, and which has the reputation of having made

more rapid advancement than any other, is without any means of knowing the quality or behavior of the material when placed in the cavities of the teeth that is more used by it than all others combined. Hence the dentists at the present time are almost helpless in making a selection from the variety of amalgams in the market, the choice being entirely guesswork with them. I make this statement with evidence to sustain it beyond question of doubt, for the tests of amalgam cannot be made either in or out of the mouth without an elaborate and expensive outfit and an expenditure of much time and careful work, so that in making the selection of amalgam a simpler method must be found. Since starting these investigations I have had unusual opportunities to ascertain what amalgams the profession were using, and I have found some of the very poorest in the hands of the best operators. In one brand especially it would be hard to find any less desirable qualities; yet this amalgam I found in more first-class dentists' offices than any other. The answer from dentists why they had selected this or that amalgam demonstrated the fact that they had no idea what working qualities it must have to be fit for use. Most practitioners demand that an amalgam should be very plastic to be easily mixed, and require but little mercury; yet the exact opposite of these qualities characterize a good alloy. The use of plastic amalgams is a great mistake, for it is impossible to pack it perfectly in a cavity. This is readily demonstrated by manipulating under a magnifying-glass. The mass will be seen to move or shift from one side to the other, working like a molten mass.

Another mistaken notion is that an alloy is injured by manipulation after it commences to set. The exact opposite is true, for a stronger and better mass can be made if the amalgam be properly handled and put to place by heavy hand-pressure, or by malleting after it has fairly begun to set. This may not hold true with all varieties, since my experiments and investigations have been confined to one preparation; but I believe it will be found true as a general rule.

The third fallacy accepted by so many is that the least amount of mercury possible to make the mass pliable is the correct manner of mixing; but in this case again the opposite is true. The greater amount of mercury that can be incorporated into an alloy without squeezing out any surplus when reasonable pressure is applied the stronger the filling will be. An amalgam which is easily mixed is generally recommended, when exactly the opposite is evidence of a good alloy.

I have brought with me the micrometer, two kinds of dynonometers, and other implements, and invite inspection and practical tests with the variety of amalgams I have procured. In this way I hope to arouse more than usual interest in this important subject, although all tests cannot be completed, as some amalgams will shrink and expand so that the reading will not show changes for many days, and the blocks of some will not harden enough to test their exact characteristics as to stress and flow in twenty-four hours, or even in forty-eight hours. However, many essential qualities may be shown while we are here, and I hope the benefits gained by those listening and taking part will be as great as the pleasure I have derived from this work.

The discussion of this subject was made the first order of to-morrow morning's business.

Adjournment.

(To be continued.)

JOINT CONVENTION OF THE AMERICAN AND SOUTHERN DENTAL ASSOCIATIONS.

JOINT CONVENTION, held in the pavilion of the Hygeia Hotel, Old Point Comfort, Va., on Thursday, August 5, 1897, at half-past twelve o'clock.

The meeting was called to order by Dr. Fillebrown.

Dr. John B. Rich, of Washington, was nominated Chairman of the meeting, and Dr. Walker, of Atlanta, and Dr. George H. Cushing, of Chicago, Temporary Secretaries.

Dr. Patterson.—I introduce the following resolution and move its adoption :

Resolved, That the members of the American Dental Association and the members of the Southern Dental Association do hereby organize themselves into a body to be known and styled as the National Dental Association.

Motion carried.

Dr. Marshall.—I would offer the following resolution :

Resolved, That the constitution, by-laws, and rules of order decided upon and presented by the joint committee of these two bodies be and are hereby adopted as the constitution, by-laws, and rules of order of the National Dental Association.

Resolution adopted.

Dr. Richards.—I desire to offer the following resolution :

Resolved, That no speaker shall occupy the floor for more than three minutes, without the consent of a majority of this body, during this session.

Resolution adopted.

Dr. Ottofy.—I move that we proceed to the election of officers.

Motion seconded.

Dr. Ottofy.—As there seems to be some objection to that at the present time, I move that the motion as to the election of officers be laid on the table.

Motion carried.

Dr. Beadles.—I move that the constitution and by-laws as adopted by this body be read by the Secretary.

Motion carried, and the Secretary read the same.

The Chairman.—You have heard the reading of this constitution, by-laws, and rules of order; they are now before you for action. What is your pleasure in regard to them?

Dr. Marshall.—The constitution, by-laws and rules of order have already been adopted; the gentleman merely asked to have them read.

Dr. Ottolengui.—I move that the motion to proceed with the election of officers be now taken from the table and acted upon.

Motion carried.

The Chairman appointed Dr. Noble and Dr. Hunt as tellers, and the election resulted as follows: President, Dr. Thomas Fillebrown, of Boston; Secretary, Dr. George H. Cushing, of Chicago; Assistant Secretary, Dr. W. E. Walker, of Atlanta; Vice-President from the East, Dr. James McManus, of Hartford, Conn.; Vice-President from the West, Dr. L. L. Dunbar, of San Francisco; Vice-President from the South, Dr. B. Holly Smith, of Baltimore; Corresponding Secretary, Dr. Emma Eames Chase, of St. Louis; Treasurer, Dr. Henry W. Morgan, of Nashville.

*Executive Committee.*¹—Dr. G. L. Noel, Dr. J. N. Crouse, Dr. V. H. Jackson, for three years; Dr. M. F. Finlay, Dr. J. D. Patterson, Dr. H. A. Smith, for two years; Dr. George Eubank, Dr. W. P. Dickinson, Dr. C. N. Peirce, for one year.

Dr. Marshall then offered the following resolution :

Resolved, That the Treasurer of this Association be directed to request the Treasurers of the American Dental Association and the Southern Dental

¹ Appointed by the Chair, upon motion of Dr. Beadles.

Association to furnish him with a list of the permanent members in their respective Associations, and that he is hereby directed to add the names so furnished to the constitution of this Association, as set forth in the provision of membership, Article 3, Section 5, of the Constitution; and be it further

Resolved, That such act of the Treasurer shall be legal and binding, the same as if the names had been attached by the persons themselves.

The place of meeting next year was then voted for; Dr. Crouse placed the cities of Omaha, Minncapolis, and Denver in nomination, Omaha being finally selected.

Dr. Marshall offered the following resolution :

Resolved, That a committee of three be appointed by the President of this Association to take into consideration the question of establishing a journal for the publication of the transactions of this Association and other original matter pertaining to dental surgery and the collateral sciences, and that they report to this body at the next annual meeting.

Resolution adopted.

Dr. Crawford offered the following resolution :

Resolved, That it is the sense of the National Dental Association that when any member of the dental profession in good standing presents a certificate of registration from any State in the Union he shall be admitted to registration in any other State of the Union when presenting such certificate of registration and good standing professionally, without an additional examination.

Dr. Crawford.—The moral force that that resolution carries with it will do more to deter young men in this country from engaging in the practice of dentistry illegally than anything else. Whether this Association endorses this sentiment or not, it is right. It is only advisory,—it is not compulsory,—but it carries with it all the force that moral suasion is capable of carrying with it.

Dr. Donnelly.—Who is to be influenced by it? Certainly not the boards that are governed by the laws of their own States. Is it directed to the Legislature or the examining boards?

Dr. Crawford.—To the examining boards.

Dr. Marshall.—It has always seemed to me that the laws of the States regulating the practice of dentistry, which deprived a citizen of one State from gaining his livelihood in another, would be declared unconstitutional if carried into the United States Supreme Court.

Dr. Crawford's resolution adopted.

Dr. Crouse.—We have adopted a constitution and by-laws; the printed copies that have been sent out have been corrected. This

Association should authorize Dr. Fillebrown to have corrected and printed a sufficient number of copies of the same.

Dr. Morgan offered the following resolution :

Resolved, That the two Associations, the American Dental Association and the Southern Dental Association, participating in this organization be requested to contribute one dollar per member to the treasury of the National Dental Association, and that in view of this contribution all dues be remitted from such names.

Resolution adopted.

Dr. Hunt offered the following resolution :

Resolved, That a committee of three be appointed by the President of this Association to report at the next annual meeting measures looking to the preparation of the full history of the dental profession.

Resolution adopted.

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held at Young's Hotel, Wednesday evening, May 5, 1897, at six o'clock. President Andrews in the chair.

Subject for discussion was "Replantation of Teeth."

Dr. Perrin.—The operation of replantation, though rarely required, is one that should be familiar to every dentist, for occasionally a case presents itself in which no other treatment will effect so rapid a cure.

I have had several cases where replantation was resorted to, with such happy results that I feel prompted to state them at this time. In each of these pericementitis was present to such a degree as to cause unbearable pain; removal of the filling or perforation of the tooth was impossible. My method has been, after extracting the tooth, to remove the filling, cleanse and disinfect the pulp-cavity and root-canals, and fill the same with the usual materials. I also remove the inflamed portion of the pericementum and grind away about one-sixteenth of the apex of the root. The socket is then washed out with warm water, being careful to remove all clotted blood. The tooth is then pressed firmly into place, and perfect adaptation results in about a week.

My first case was in May, 1884. A man about thirty-five years of age, with a left superior bicuspid affected with periodontitis. The tooth was extracted and replaced, and has served well for over

ten years. My second case was in November, 1886, also a left superior bicuspid, very sore to the touch, and containing a large amalgam filling, the removal of which was impossible. The tooth was extracted and replaced, and in less than a week was as useful as ever. It is still perfectly firm and useful.

CASE III.—December, 1890. A young man twenty-two years old. First right inferior molar in same condition as the preceding cases. This was extracted and replaced, and, although it was necessary to grind the roots quite extensively to make them parallel, the tooth soon became firm and healthy, and is now in good condition.

CASE IV.—November, 1892. A lady brought in her hand her second left superior molar carefully tied up in paper, it having been extracted by mistake while removing the third molar. This was replaced, and is to-day a useful tooth.

President Andrews.—How many cases have you had in all?

Dr. Perrin.—Only these four that I have record of. I have had several others the results of which are unknown.

Dr. Cutter.—Did you say you simply washed out the socket with warm water?

Dr. Perrin.—Yes; but I am sure to get out all particles of loose tissue and scrape off the reddened pericementum from the root.

Dr. Bradley.—May I ask Dr. Perrin if in any of these cases there was an established fistula?

Dr. Perrin.—In none of these cases had there been an abscess formed; there was simply a condition of pericementitis.

Dr. Stevens.—I had a case where I removed a right central incisor to relieve an alveolar abscess, a blind abscess that was very painful. I removed the tooth, cleansed the socket of the abscess, thoroughly sterilized the socket and the tooth, filled the canal, and returned the tooth to its place. The patient in two days was entirely over the effects of the operation, and the tooth has never given further trouble.

Dr. Bradley.—Did you wire the tooth in place?

Dr. Stevens.—I did, but removed the ligature after two days.

Dr. Allen.—I have had three of these cases altogether. The first was that of a young woman who came to me suffering from a severe chronic alveolar abscess with a fistula over the left superior cuspid. Another dentist had previously treated the tooth, but to be able to work intelligently I removed the filling, and found the canal (which had been filled with gutta-percha) free from odor and perfectly sealed to the apical foramen. After opening the foramen and treating the case several days, I was surprised to find

that my patient experienced no relief. I then decided to extract the tooth, to which proposition the patient readily assented. Upon removing the tooth, I discovered the cause of the trouble to be a sharp spur of calculus extending at right angle from the root, at a point fully an eighth of an inch from its apex. I removed the calculus, polished the roughened surface (there being no evidence of necrosis), and returned the tooth to its socket. It was my pleasure to examine the case two weeks ago and to find the tooth apparently as firm as any normal tooth, having stood a three years' test.

Another case was that of a lady sixty years of age. The tooth in this instance was the right inferior sixth-year molar, which I treated in the same manner as described by Dr. Perrin. A year later it was doing well, but I have had no report from the patient of late, though it is likely I should have been informed had any unfavorable symptom developed.

The third case was that of a gentleman for whom I crowned the left superior first bicuspid. In drilling out the canal for the pin of the crown I accidentally encroached upon the bifurcation of the root; this opening was sealed as well as possible with gutta-percha and the crown adjusted. The tooth remained comfortable for six months or so, when it began to show signs of suppuration. Knowing well the cause of the trouble, I extracted the root and the crown together, filled the perforation in the root with gold, and then replaced the root in its socket. The gentleman is now in Europe, and but recently sent me word that the tooth was still doing good service.

Dr. Adams.—I have had some experience in this line. One case in particular which I remember was that of a lateral incisor which had an alveolar abscess that had been discharging for three years. I could not cure the case, so I extracted the tooth and cut off the end of the root, which was denuded, and returned the tooth to its socket. It remained in a perfectly healthy condition for years, until the death of the patient. The details of the operation were as follows: The root was filled through a cavity in the palatal surface; this cavity was filled with gold, which was built out beyond the surface, and the ligatures which were to secure the tooth in place were embedded in the filling; this was done to prevent the slipping of the ligature.

Several years after the replanting of the tooth a cavity appeared in the proximal surface, and I wedged the tooth apart and filled it without injury to the tooth.

I find that the length of time during which such teeth will serve

is variable. Some of them have, at the end of perhaps seven or eight years, suddenly given out, and I would find that the root was badly absorbed and the tooth had gone completely to pieces. But I think in cases of abscesses which are obstinate it is very good treatment.

Dr. Eames.—At a meeting of the Massachusetts Dental Society in 1884 I exhibited a case in which the superior lateral was turned on its axis, so that its mesial surface presented directly forward, and I then explained that I had extracted that lateral, enlarged the socket, and returned the tooth to its proper position in the mouth. I had also another case answering in every particular to the one just described, and treated in the same way. The replanted teeth performed satisfactory service in each case for about ten years, when, as I have been informed, they came out. I thought it rather remarkable that they lasted about the same length of time.

Another case was that of an inferior cuspid, replanted about the year 1877, and which did good service for about fifteen years. Some other cases lasted perhaps not more than six to eight years. Two or three are still giving satisfaction, with a record behind them of eight years. I will simply refer to two cases of recent interest,—one a superior left central which had had a fistula on the labial surface for a number of years. A crown had been put on by a former dentist, which had been recently removed in order to treat the root, and the present dentist had treated it for months without healing the fistula. I saw the case in consultation, and after making a counter-opening and injecting antiseptic fluids freely without good results, I etherized the patient and made a free incision near the apex of the root, removed the tissues there, and with a large new bur amputated the end of the root and burred away the bone in the vicinity. But the fistula still continued to discharge. The last resort was the plugging of this central root (which was a mere shell) with wood and extracting it. It was found that on the palatal surface of the root was an opening from the canal which had been drilled through, and that filling-material had been stuffed through this opening plentifully. It was in such a position that it would have been impossible to get at it by any reasonable surgical interference without extracting the root. After curetting the surface thoroughly and washing the cavity with bichloride of mercury solution, I prepared the root and returned it to its socket. A plate which was being worn kept it in position, overcoming its tendency to come out. This was done about six weeks ago, and the tooth is now doing very well, being fully as firm in its socket as before being treated.

In another recent case there was violent inflammation with swelling of the face and gum, and a fistula from a superior right cuspid. On account of the great pain the tooth was extracted, and a large sac was found at the end of the root. This was removed with a portion of the root and the tooth returned to its socket. This tooth had a strong tendency to come out; holding it in place for a long time with the fingers was not sufficient to keep it there, I therefore ligated a wire to the second bicuspid and passed it over the cuspid and ligated it to the lateral. The implanted tooth was then tied down to the wire, which held it in place. It now appears to be as serviceable as any tooth.

Dr. Robinson.—I had a case, I think it was in 1873 or 1874. A gentleman came into my office with a tooth that was aching and wanted it extracted. Examination showed a cavity which extended nearly to the pulp. I wanted him to allow me to destroy the pulp and fill the canal, but he was impatient and would not have it done, so I was obliged to extract the tooth. I told him I thought it was too bad to take out a good tooth like that and break up the arch, and I suggested filling it and replacing it, and this he agreed to. I have seen him within two years, and he said that it was the best tooth in his head. I have had several other cases that turned out very nicely.

President Andrews.—Perhaps Dr. Preston will tell us of his experience in this line.

Dr. Preston.—I have extracted several teeth and filled them and put them back again, but I cannot now recall one that ever amounted to anything. The roots all became rough and looked worm-eaten. I filled one for a young boy away back in 1839. In those days you could not destroy the pulp as you can now, and it was necessary either to extract the tooth and put it back, or keep it out altogether.

Dr. Belyea.—What did you fill the roots with?

Dr. Preston.—I did not fill the roots at all, but filled the external cavity with tin-foil. I found one man who seemed to be well pleased with the result of the operation. I asked him about the tooth several years after replacing it, and he said that he had never had any trouble from it, and if any one wanted to know about such an operation to send them to him. The most peculiar case of replantation I ever heard of was that of a lady for whom I extracted a tooth as far back as 1842. She felt badly about having it extracted, and she afterwards told me that when she got home she took an iron spoon and melted some lead, washed the tooth thoroughly,

carefully poured the lead into the cavity and put the tooth back in her head. I do not know how long it lasted her.

Dr. Werner.—We have only heard of favorable cases of replantation; while I could perhaps report two that were favorable, I have distinct recollections of two unfavorable cases. In twenty years' practice I have had perhaps six or seven cases, two of which could perhaps be considered favorable, but two others were lamentable failures. I do not consider my experience to be entirely successful, and only in extreme cases do I consider the operation justifiable. I should not think of replanting a root in a diseased socket. I had a case recently where I thought of replanting, and would have done so if I had felt fairly certain of the result. In resetting a bridge I was obliged to remove one of the roots, a central, which was perhaps one of the best of the supporting teeth, and I wished that I could have felt justified in replanting that root.

President Andrews—I recall two cases of abscessed teeth, where I extracted the teeth, carefully filled the roots, dressed them down, and replaced them in their sockets; I noticed that in a year or two they became solidly fixed to the jaws, calcified so solidly that in tapping them they appeared to be a part of the jaw. It seemed as if the periosteal tissue about the teeth had completely calcified, and I think you will find that in most cases of replanted teeth on tapping them they give the impression that they have become united by calcification to the alveolus. In my cases the teeth began to loosen in a few years, and the roots seemed to be nearly absorbed through the action of the cells which we call the osteoblasts. Both cases had a similar history.

WILLIAM H. POTTER, D.M.D.,
Editor American Academy of Dental Science.

ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

THE regular meeting of the Society was held October 8, 1897, President Brubaker in the chair.

Upon the completion of the routine business Dr. George W. Warren read his paper on "The Therapeutic Treatment of Infected Tooth-Root Canals."

(For Dr. Warren's paper, see page 11.)

DISCUSSION.

Dr. Litch.—The oil of cassia has no high germicidal power, but is as nearly non-irritant as any of the series. The essential oils do not diffuse quite as rapidly as would some other antiseptic substances more nearly harmonizing with the watery constituents of the tubuli, such as sulphuric acid, or hydrochloric acid, or the peroxide of hydrogen. Nevertheless very satisfactory results can be obtained by relying solely upon the essential oils, and I often make them the basis of my antiseptic treatment.

The use of nitrate of silver is likely to produce discoloration of the teeth. The same objection is valid as regards mercurial preparations, more especially the bichloride. Nitrate of silver, however, is advantageous in certain cases of blind alveolar abscess. These abscesses, as you know, are troublesome to manage, especially those in the inferior bicusps and molars, where we hesitate to put a drill through the bone for fear of injuring arteries or nerves. We have to drill through the apical foramen, and so draw off the contents of the sac through the canal. This is very readily accomplished, and, as a rule, gives immediate relief from the pain. After having drained the sac, however, it is difficult to treat the pulp-canal antiseptically and thereby cause healthy granulations in the tissue beyond the abscess itself. I have tried a great many remedies, especially bichloride, but have finally settled upon silver nitrate, used in such a way as to avoid or reduce to a minimum the danger of discoloration. My plan is to enlarge the opening to the root-canal with a moderate-sized drill, drain off the contents, and pass in some varnish solution, getting a film on the cavity and pulp-canal to protect it against the osmosis of the silver nitrate. Then I take a probe of considerable size and dip it in finely powdered silver nitrate, getting a portion on the end of the probe, and carry that through the pulp-canal, thus depositing it in the sac itself. The canal is then sealed temporarily with a small cone of gutta-percha. This treatment may cause some little pain, and will inevitably cause a discharge of pus and serum. But a redressing will usually cause painful symptoms to subside. After one such application we ought to trust a little to nature. In a few weeks all the discharge will probably dry up, and the canal can be filled in the usual way. I take a small cone of gutta-percha, dip it into eucalyptus oil, which is an admirable antiseptic, and thrust that up into the apex of the root. The rest of the canal is then filled with gutta-percha softened by heat. I have my instrument dipped

in finely pulverized French chalk, which greatly facilitates packing.

Dr. Truman.—The question as to whether essential oils pass through the tubules does not interest me, for the reason that we cannot prove it. Dr. Harlan tried to demonstrate it several years ago, and he thought he succeeded. I have tried out-of-the-mouth experimentation in the laboratory, and have been unable to determine whether or not a fluid will pass through the root by simple osmotic action. You all know the experiments of Drs. Kirk, Harlan, and others in that direction, and I have found, by repeating their experiments, that it was impossible to know whether there was any fracture, cracks, or conduits through the root, and in many instances I thought that the fluid in the root would pass almost immediately through the tissue, so that I became very sceptical in that respect. But I know of no experiment in essential oils acting upon the protoplasmic fibre in those tubes that is of any special value, and I do not believe that the mere action of the oils on the decomposed portions of the pulp in the main canal is the only procedure necessary. The tubes of the teeth contain a microscopic fibre so extremely minute that while one is unimportant, yet when all the organic matter in the tubes of the tooth is taken into account it makes an amount of material that must be attended to. It is impossible to perfectly treat a tooth until the contents of these tubes are made aseptic. How is this to be done? We are not certain that essential oils will do it. I was interested when Dr. Warren said that he placed essential oils in the canal, and followed them with oxychloride of zinc. I think I demonstrated a few years ago, in regard to essential oils and coagulants, that oxychloride of zinc acting through its free chloride of zinc would coagulate the albumen in any of the tubes in which I placed it to the same extent as would pure chloride of zinc; and if that be true, and the experiments proved it, then the oxychloride of zinc and not the essential oils did the work. That is, it coagulated all filaments in the tubules throughout the body of the tooth. I know it can be done by the oxychloride of zinc, but it is equally and better done by the chloride of zinc.

In another case Dr. Warren spoke of relieving the tooth absolutely and of closing the fistula. If I understand correctly, when a tooth has a fistula it means a certain portion of the bone around the apical foramen has lost its periosteum. I hold that a tooth that has once abscessed can never be restored to health. It is no more possible to have a healthy condition result from a seques-

trum in a necrosed jaw than it is from a necrosed portion of cement. In order to make a tooth perfectly healthy, treatment must be continued beyond the central canal, and there is no certainty that the essential oils will do it. But there is a certainty that the coagulants will. I demonstrated that very fully not only by capillary tubes and enlarged tubes, but I demonstrated it on teeth in the mouth, and also on teeth out of the mouth. These I examined microscopically, and invariably found that the chloride of zinc had coagulated the filaments in the tubuli to the extreme ends. Some say that coagulants will decompose under microbic influence just as well as other agents. I deny the assertion. I examined, only to-day, some albumen that had been under the effect of chloride of zinc for three years, exposed to all conditions, and decomposition was not present. It has not only changed in the test-tubes to a gelatinous mass, but it has changed in the same way in all the tubes I have treated, and if that be the case when we place a coagulating agent in a tooth and the protoplasm becomes coagulated and eventually gelatinous, the tooth always will remain clear. This is the result not only of theory, but of practice. Now, the objection to chloride of zinc has been that it will produce inflammation in the pericementum. That is true, provided it is pushed beyond the foramen. Therefore, I would not use anything but oxychloride of zinc.

Now, a word on the subject of nitrate of silver. I think I demonstrated that nitrate of silver cannot be controlled. It will penetrate into a tooth through the tubes and change the whole character of the albumen. Microscopical examination settled this to my own mind. I applied it to teeth and examined them microscopically. This also has been demonstrated by Drs. York and Bethel, although Dr. Bethel believes that nitrate of silver can be safely used where it is protected in the crown and used carefully in the root. I agree with him. It will not go beyond a certain distance in the tubes, but it is difficult to know where it will end. I would not use it at all where discoloration was an important factor.

Dr. Peirce.—The essayist made some allusion to the antiquity of solutions for septic canals. While I have not been in practice as long as my friend Dr. Truman, I want to say that canals were treated before we appreciated their condition. Before we had a knowledge of the micro-organisms that infected them, carbolic acid, creosote, and iodine were used. But carbolic acid, creosote, and iodine were used because they were efficient in practice. The

first case I remember was a dentist bringing his wife into my office. She was suffering with an abscess. There was a fistula and a discharge of pus. The root-canals were cleaned out as thoroughly as possible, and the creosote forced through until it made its appearance at the fistulous opening. Now, Professor Truman says the parts were not restored to health. They were passive afterwards. If the tooth was previously necrosed, it could not be restored to health. Neither can we say that the space around the apical end was restored, but the abscess was entirely cured, and there was no trouble afterwards from that tooth. Now, we have all treated teeth in that way, with the result that we have brought them into a passive if not healthy condition, but they are as serviceable. I am very much in favor of Dr. Truman's chloride of zinc. I have never found any remedy so effective as this in the treatment of septic canals. But the preparation of that canal for treatment is quite as important as treatment itself. We have never had any agent presented to the profession that has given us such universal satisfaction as that of sulphuric acid in the root of a tooth for the purpose of softening tissue and enlarging the canal. It is true, chloride of zinc forced through the foramen and coming in contact with the tissue does create some irritation and give some pain. But it causes the parts to heal rapidly. At the risk of giving patients trouble for twenty-four hours I cleanse out the canal and use a strong solution of chloride of zinc, even going so far as to place in a crystal. As Dr. Truman says, in those tubuli we have dead material, and dead material that must be disposed of. But if we cleanse as nearly as possible, then sterilize with chloride of zinc, and fill with oxychloride of zinc, the septic matter from the small tubuli that runs off from that canal will be harmless. It matters but little whether the canal is filled with fibres of cotton saturated with wood creosote or fibres of cotton mixed up with the paste of oxychloride of zinc.

Dr. Gaskill.—My experience in treating the canals of teeth has been that the essential oils are not altogether satisfactory. I do not think that they are sufficiently penetrating or permanent. The chloride of zinc and the oxychloride of zinc have been the most satisfactory, but the prime essential in the treatment is the thorough removal of all foreign substance. After that is done it matters little what antiseptic is used, so long as it is one that is fairly efficient. Creosote seems to be more efficient than any of the essential oils. For a number of years I have filled a great many of my canals with gutta-percha, first saturating the canals with iodoform and oil of

cinnamon. I have cases of six years' standing where these fillings have been successful.

The President.—If the Society will permit I would like to ask whether in the experience of dentists present the systemic condition of the patient at the time of treatment has any bearing upon the results that are to be expected, and if the constitutional or systemic condition requires a supporting treatment? In thinking of this condition it occurs to me that if it were in any other part of the body a physician would try to raise the health of the general nutrition as well as to treat the condition. For we know that the systemic condition will be more or less resistant to micro-organisms, and the higher the level of the system the greater will be the success of the treatment.

Dr. Litch.—Theoretically, it is absolutely true that systemic treatment would assist to combat all irritative influences. Practically, we are confronted with these septic conditions. They are usually urgent, requiring immediate action. It is not often practicable for us to administer general treatment in this class of cases. There is a vast difference in the susceptibility of individuals. We have some who seem to run to inflammations, and others in whom they occur with much less frequency and apparently with a great deal of difficulty, because they have thoroughly healthy constitutions.

Dr. Truman.—I do not think dentists usually pay any attention to general treatment. When our patients come to us the majority do not require it. But there is a class of patients that the dentists should pay more attention to,—those anæmic young ladies who range from fourteen to twenty years of age. I speak of these rather than young men, because they are more liable to weakened conditions at that period. They run to inflammations very rapidly, and one can scarcely ever treat such a case for the destruction of the pulp that pericemental suppuration does not threaten. A dentist will place arsenic in the pulp without any regard to the physical conditions. Is that right? I think not. The dentist will do all sorts of things with these teeth,—separate them with separators and produce inflammation, that has to my knowledge resulted in the worst kind of necrosis. It is certainly necessary to support the constitution, or at least to give attention to these pathological conditions that are likely to supervene when we undertake treatment of those cases.

Dr. Peirce.—Our attention is very frequently called to discomfort from a septic canal, when the discomfort is closely connected with some depression of the vascular systemic condition. I have

had many cases where pulps have been dead and passive for months. Forty years ago I had a patient who suffered badly from small-pox. When she recovered the pulps in the central lateral incisors and bicuspsids had died. There was not an external flaw in the teeth. And yet the pulps one after another had died, and had to be drilled into and removed. A very interesting circumstance followed in the cuspid. It became sore from peridontitis, and death of the pulp was apparent. I had prepared a slab and a cover. The very moment my drill went through into the chamber I placed some of the material on the slab, covered it, and the slab under the microscope was seen to be alive with micro organisms. Dr. Joseph Leidy said he would like to see the specimens immediately. I prepared a paper, and it was discussed as to how the micro-organisms, without any abrasion in the tooth, could have infected that pulp-canal. That was the first time I ever heard they were latent in the blood and only waiting for some opportunity for a pabulum to produce them in dead material. Leidy took part in the discussion. It appeared reasonable that there could be no other way for micro-organisms to infest the chambers of the teeth but through the blood, or possibly through the air when the canal was opened.

Dr. Truman.—Was the slab sterilized?

Dr. Peirce.—Yes; and the instant the material was brought out it was covered, and yet the contents were full of micro-organisms. That decomposition had taken place before the tooth was opened is certain. We had the inflammatory condition which results from putrefaction. Therefore the blood must, in a normal condition, be infected with these forms of life that are latent and go through the system all the time, and only develop offensively when opportunity offers them sufficient pabulum.

The President.—Will Dr. Warren close the discussion?

Dr. Warren.—I am pleased that the paper presented has brought about the result desired,—a free expression from others. I knew that there were several gentlemen present that had hobbies, and hoped they would be frank in presenting their views. Dr. Truman made a mistake in stating that the tooth having the fistulous opening was filled with oxychloride of zinc. It was the first one treated where this filling-material was employed. As to whether the end of a tooth is necrosed, referring to the second case, it matters little so long as nature comes to our aid in removing the trouble. We can hardly say the tooth returns to a normal condition, but, as Dr. Peirce observed, it becomes passive and useful. As I have said,

the lower molar was filled with oxychloride of zinc; but whether this material played a part in the preservation of that tooth I do not know; I can testify, however, that the inflammatory condition was removed entirely by the introduction of oil of cinnamon, and that during the lady's stay in this city the gum returned to an apparently normal color. The very best testimony we can have along these lines is practical results.

Adjourned.

JOSEPH HEAD, M.D., D.D.S.,
Editor Odontological Society of Pennsylvania.

Editorial.

WRONG IMPRESSIONS.

LANGUAGE is supposed to convey to other minds the thought of the individual using it, but, unfortunately, it does not always carry with it the motive which impels the utterance. This is apparent every day in life, presenting at times an amusing, at others a serious, side. It is probable that a large proportion of the antagonisms of the world follow misconceptions as to the spirit of the writer or speaker. This is the natural result of different states of mind.

This thought has received special prominence since the December issue of this journal. The writer of this took occasion, under the head of The Southern Dental Association, to quote the President of that body, in a few lines taken from the circular issued by himself. This was done not to antagonize the circular or the Southern, but simply to deprecate, in a few words, the *spirit* which seemed to the editor to be manifested,—that of a strong appeal to sectional feelings, which seemed to him out of place at this period.

In a pleasant letter received from Dr. Beadles, the President, in response to an explanatory letter from the writer, it was made evident that the editorial in question was regarded in a different light from that intended, and that the editor of this journal, possibly affected with mental strabismus, failed to discover the actuating motive of the circular. In view of this fact it is due Dr. Beadles that his reasons for its issue should be as prominently given as the editorial in question. The following quotation from his, specially relative to this, may answer. We would be pleased to give the letter entire did space permit.

Dr. Beadles writes, "Words seldom convey our real meaning. Your words made a different impression upon me from what you intended, so did mine upon you in my little circular. This circular was intended for the Southern men, and with it I was simply trying to arouse some interest through our *pride*, which is a strong factor with us. Not a thought of 'sectionalism,' in its objective sense, was in my mind. The truth is, the American and the Southern agreed to form a 'National Dental Association' rather than to *combine*. All of us recognized the wisdom of having one leading organization. The American had a perfect right to continue its existence, but as it did not, I see no obligation resting upon the Southern to go out of existence as a branch. You may not understand, but there is a peculiar necessity for the existence of this Association. It will not in any way interfere with the national organization, and will perform special work here in the South that could not possibly be done by the National. For this reason do we expressly desire to continue it. So my idea is that we should let things alone as they are for the present, say nothing nor do anything that will kindle hard feelings. If the plan does not work, some other may be adopted. I believe the *intention* of the Southern men was to *do right*, to do whatever was best for the profession at large, and then do what was best for our section."

The misconception of meaning in former editorials is apparent in this further quotation: "You say you have the kindest and best feelings towards the Southern, and I believe you, but heretofore all of your editorials upon this question have made a very different impression upon me. I was more than pleased that I was mistaken." This makes it imperative that the editor of this journal should plainly state what his ideas have been in regard to this matter of the union of the Southern with the American.

It is difficult to understand how any one could get the impression from any of the editor's writings that he was antagonistic to this union. For years he has been outspoken in regard to it, in conventions and wherever dentistry and things pertaining to its interest were considered. His hopes were centred at Old Point Comfort on this one thing. It was regarded by him as eminently proper that both the American and the Southern Dental Association should remain as organizations in their respective districts, but that a new body of an entirely different character from either, but of a higher order, should be formed. It was fully in accord with this idea that the Southern men decided not to make any change in name, but concluded to continue the Southern as a branch. This

seemed to the writer to be a logical conclusion, and he was so much impressed with the fact that he retired from the presidential chair for the purpose of advocating a similar course for the American. This suggestion found but few supporters, and the American died and the Southern lived. In the opinion of the writer wisdom was on the side of the South.

Dr. Beadles expresses the hope that nothing will be done to "kindle hard feelings," and in this we are perfectly in accord, but while recognizing this, the editor of a representative dental journal has a higher duty to perform. He cannot stop to consider whether this or that one will be touched upon tender sensibilities, but must rise above mere personal prejudices, if any exist, and view things from a higher altitude. The man who cannot do this is unfit to conduct a journal. That all he writes should have the stamp of his individual character is a truism, but it does not follow that there need be illiberal treatment of subjects.

In conclusion, it is hoped that the Southern will be attended in February by those who can go from all sections of the South, and that it will then and there show to the North that the greatest mistake ever made was in destroying a thoroughly organized body, leaving in its place a dead memory.

We have faith in the good sense of the men in the ranks of dentistry, and look forward with hope to the establishing in the future of an organization worthy of its advanced culture. When that time comes we will have the Northern, Southern, and Western organizations working harmoniously with that higher body yet to be formed.

Bibliography.

TIN FOIL AND ITS COMBINATIONS FOR FILLING TEETH. By Henry L. Ambler, M.S., D.D.S., M.D., Professor of Operative Dentistry and Dental Hygiene in the Dental Department of Western Reserve University, etc. Philadelphia: The S. S. White Dental Manufacturing Company; London: Claudius Ash & Sons Limited, 1897.

This is a small volume of one hundred pages on the history of the use of tin in dentistry, methods of use, and value as a filling-

material. It requires some courage in this day of amalgam using and experimentation for one to come forward and advocate the use of a metal that occupied a quite different relation to amalgam forty years ago than it does at the present time. In other words, amalgam then was regarded as an abomination, and tin was held next to gold in preservative value. That these conditions have been reversed does not by any means prove that the dentist of the year 1897 is correct in his judgment or practice.

The present writer can have naught but commendation for this labor of love on the part of Dr. Ambler, for the best of reasons that he has been a devoted adherent of tin as a filling-material since he began the practice of dentistry.

Dr. Ambler has been at great labor to compile the views of practitioners in the past, for the accomplishment of which, Dr. McKellops, of St. Louis, very kindly gave him the free use of his dental library, probably ranking first in this country, if not in the world. These references carry the use of tin as a filling-material back to 1783, but it was probably used anteriorly to that date.

It is satisfactory to find the author packs his tin on the cohesive principle, the only method in use by the writer for over thirty years; but if he would use a slightly heavier foil than that usually selected and make tapes without folding, it is thought better results could be attained.

Dr. Ambler insists on absolute dryness. While this is correct for all metals used in the mouth, it does not alter the fact that tin can be packed upon the cohesive principle under water. This quality, for it is a peculiarity in its working properties, becomes of great value in filling children's teeth where the rubber dam or the napkin is an impossibility. Where this is done all parts must be submerged in water.

This little book is cordially welcomed, not because it contains anything new, for it does not, but because it carries with it the hope that one of the most valuable filling-materials will not die out of practice so long as such an enthusiastic defender is left to earnestly urge its good qualities upon an unbelieving profession.

Obituary.

CHICAGO DENTAL SOCIETY—RESOLUTIONS OF RESPECT.

THE following resolutions were passed at a meeting of the Chicago Dental Society, October 5, 1897:

WHEREAS, Again we are called upon to record the name of a distinguished American dentist among those whose life work is finished and whose achievements form a conspicuous part of the history of dentistry the last quarter of a century.

The life of Dr. Frank Abbott was one of great worth to dentistry in America. During a period of about thirty years he was at the head of the New York College of Dentistry, and with this institution—one of the foremost in our country—his name will ever be inseparable.

Dr. Abbott was honored by election to the presidency of the American Dental Association, the Association of Dental College Faculties, and other bodies with which he was connected, and was recognized as one of the leading men in the profession.

Resolved, That in the death of Dr. Frank Abbott the dental profession has lost a member whose affability won him our friendship, and whose earnest efforts in advancing dentistry among practitioners and as an educator placed him among the foremost men in the profession; therefore, be it

Resolved, That the Chicago Dental Society deeply regrets the untimely death of Dr. Abbott, and conveys herewith its sympathy to his family in their bereavement.

Resolved, That a copy of these resolutions be spread upon our records and a copy be sent to the dental journals and to his family.

WHEREAS, The change so rapidly taking place among the pioneers of our profession has been conspicuously marked in the death of Dr. L. G. Ingersoll, of Keokuk, Iowa.

Dr. Ingersoll was a leader in the profession and contributed largely to its literature. His standing as a man of broad education gave him a prominent place among educators and literary people, and commanded the attention of all audiences which he addressed. Dr. Ingersoll was not only a scholar, but he was an earnest worker and an eloquent speaker.

Resolved, In the death of Dr. Ingersoll the profession has lost another distinguished member, whose life work was in the interest of a higher educational standard.

Resolved, That a copy of these resolutions be placed on the records of this Society and published in the dental journals, and that a copy be forwarded to his family.

TRUMAN W. BROPHY,
J. H. WOOLLEY,
C. S. CASE,

Committee.

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Original Communications.¹

THE PHILOSOPHY OF EXUDATIVE INFLAMMATION.²

BY JOHN ROGERS, M.D., NEW YORK.

THE reaction which follows a traumatism or the introduction into the tissues of micro-organisms is conveniently called an exudative inflammation. It is a term which expresses the difference between the more violent reaction, which is accompanied by redness, heat, pain, and swelling, and the less violent and in general more chronic response produced by other forms of injury. For injury of one character or another is now conceded to be the origin of such changes as cirrhosis of the liver, endarteritis, the degenerations of phosphorus-poisoning, the manifestations of syphilis, new growths like sarcoma, etc.

The exudative form of the process is the most common. It occurs not only after the lodgement in the tissues of micro-organisms, but also after every traumatism. It is nature's response to an injury, and the changes which take place are of a conservative and reparative character. To show this it is necessary to examine each stage or step in such a reaction. In its simplest forms the exu-

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before The New York Institute of Stomatology, Tuesday evening, November 2, 1897.

orative part of the process is not so prominent as the part which is reparative. If, for example, a simple incised wound is made, aseptically, in the skin of a rabbit, the reaction is manifestly reparative. A true exudative inflammation follows, but the exudate is slight. Plasma, white and red cells, escape from the divided vessels. Fibrin rapidly forms and glues together the severed edges of the wound. The neighboring vessels dilate, and there is some emigration of leucocytes, which absorb the fragments of inert *débris* resulting from the few fixed cells killed by the stroke of the knife. Incidentally it is worthy of note that a cell does not perish unless its nucleus is damaged.

This incorporation in the white cells of living or inert particles will be discussed later, but is mentioned to show the correlation of all the different phenomena of an exudative inflammation.

At the same time with this clearing of the field karyokinetic changes are observable in the neighboring fixed cells. Out of one cell two are formed. The nucleus first shows striations, which collect at opposite sides, and around each half thus made protoplasm is heaped up and the cell divides. The result is an epithelioid cell or fibroblast; it is formative, rounded or irregular in shape, and larger than a leucocyte. The fibroblasts gradually elongate and shrink, and processes develop; in short, new connective tissue develops from the pre-existing fixed cells and the parts are restored to their original condition. The important part in this reaction is the proliferation of the fixed cells. It is brought about by indirect or direct division, by mitosis or amitosis, as it is technically called. By mitosis is meant division preceded by certain changes within the nucleus which are accompanied by the formation of peculiar lines and figures. By amitosis, or direct division, is meant the splitting of the cell and its nucleus into two without any preliminary alterations. In direct division the cell is not supposed to be as vigorous as in indirect division.

If we examine the phenomena following a more extensive aseptic wound the exudate is found to occupy a more prominent position. An example is furnished by snipping off a piece of the surface of a frog's tongue. Under the microscope there is seen to be an initial acceleration followed by a slowing of the blood-current; at the same time the vessels become dilated and congested.

Thoma has demonstrated that the well-known marginal position of the leucocytes which ensues is due to the difference in specific gravity of the red and white cells. Also that the emigration of the leucocytes takes place in the line of junction of the

endothelial cells of the capillaries and small veins. Diapedesis of the red cells occurs at the same points, as does also the escape of most of the plasma. The latter forms a coagulum over the surface of the wound and occludes the divided vessels. Then follows the repair of the injury by granulation. The pre-existing fixed connective-tissue cells and the endothelial cells of the capillaries proliferate. From the connective-tissue cells are produced epithelioid cells or fibroblasts; these are amœboid, and with difficulty to be distinguished from the leucocytes which have emigrated from the now congested vessels. The fibroblasts are embryonic in character and actively multiply; they collect in small heaps, into which a prolongation of an endothelial cell of an adjoining capillary is sooner or later pushed. This solid prolongation may join with others from its own or another vessel. Eventually it becomes hollow, and blood circulates through it. Meanwhile, the wandering cells, which are derived mainly from the leucocytes of the blood, and probably to a less extent from the proliferation of the pre-existing, fixed, connective-tissue and endothelial cells, cover the surface of the wound and infiltrate the coagulum formed just after the reception of the injury. The numbers of the wandering cells correspond directly with the amount of irritation and consequent destruction to which the surface of the wound is subjected. The same thing can be said of the exudation of plasma. If an ill-fitting shoe is constantly rubbing an ulcer of the heel, pus is present in abundance. Remove the shoe and stop the injury to the growing cells and the pus vanishes.

The purpose of the wandering cells is to act as scavengers; they incorporate and digest or carry off detritus, and the greater the emigration the more permeable the vessels become and the greater is the escape of plasma. Some of the scavengers disintegrate and are absorbed by others; many are cast off as part of the pus; a smaller quantity pass into the lymphatic system. A large number of the wandering cells serve as food to the growing fibroblasts. They probably do not, however, change into fixed cells, although the latter do become wandering cells. The amount of plasma, as previously remarked, corresponds with the cellular activity. In an aseptic wound it serves a flushing out and a nutritive purpose. It aids in the removal of effete matter and supplies nourishment to the rapidly growing cells.

My object in thus hastily reviewing the most prominent features in healing by primary union and by granulation is to emphasize the fact that in these processes there occurs an exudative inflam-

mation, which is anatomically the same as that which follows bacterial infection. That, in short, every manifestation of what we call inflammation, every term to which the ending of "itis" is added and many to which it is not, signifies that the body, made up of many elements, defends itself by assigning to each element a definite duty, which each performs according to need. The marshalling of all the forces may only be evident when micro-organisms are to be combated. All are constantly in line and ready to repel attack, but only one or two companies of the army may need to be called into action for a minor injury like an aseptic wound or contusion. For a thorough understanding of what is meant by inflammation it is necessary to carry in mind a comprehensive view of the whole field.

We pass now to the more violent form of exudative inflammation, that which follows the lodgement and growth within the tissues of micro-organisms. In this the white cells are so numerous and the *débris* so abundant that the inflammatory reaction is more commonly designated as suppurative. But it differs anatomically only in degree, not in kind, from the reaction following a simple aseptic traumatism, and its purpose is the same,—namely, the repair of the injury.

If a little of a pure culture of the *staphylococcus pyogenes aureus* is inoculated under the skin of a rabbit a circumscribed abscess develops. In and around the point of inoculation there is a degeneration and death of cells coincident with a multiplication of the bacteria. The surrounding vessels are congested and there is an emigration of leucocytes, some of which are mono- and others polynucleated. There is also an exudation of plasma and some diapedesis of red cells. A little later many of the bacteria can be made out in the interior of the emigrated white cells and in the endothelial cells of the neighboring capillaries. This incorporation of bacteria in living cells will presently be described as the process of phagocytosis. The multiplication of the bacteria gradually ceases, then the central portion of the disturbance becomes pus, or a mass of broken-down *débris*, bacteria, fatty matter, white cells, etc., and is discharged externally, leaving a cavity to be healed by granulation. An example of a less favorable termination is furnished by the inoculation of a chicken with the vibrio of *Metschnikoff*. In this instance the bacteria do not remain localized, but spread from the point of infection almost without hinderance into the blood-vessels and lymphatics and the general circulation. There is extensive degeneration of all the cells near which the bacteria

appear. This includes the cells which constitute the walls of the vessels, and with the destruction of the walls of the vessels hemorrhage occurs. At the same time in the region of the bacteria there is a copious exudation of a sero-sanguinolent fluid; but there is no emigration of leucocytes and no phagocytosis, which are two significant points of difference between the localized abscess and the general infection. In the former the leucocytes are numerous and close around the bacteria; in the case of general infection there is no massing of leucocytes; the few which appear are evidently degenerated and quickly perish.

To be complete, croupous, necrotic, or diphtheritic inflammation should be mentioned. But it mainly differs from the localized abscess and the diffuse cellulitis with general sepsis in that a mass of cells perish more or less rapidly, and together instead of slowly and one after another. Furthermore, in croupous inflammation the dead mass does not disintegrate and liquefy till after the lapse of some little time. But the philosophy of the minute phenomena is practically the same, and it is to this I want to call your attention.

The first elements to be considered are the wandering cells. Many are derived from the proliferated fixed tissue-cells, but the larger proportion have been proved by Cohnheim to be the emigrated leucocytes of the blood. These differ in their appearance, size, probable ultimate origin, and staining reactions. One of the latest classifications of human leucocytes enumerates six distinct kinds. Of these, at least two have been ascertained to have definite functions.

Their presence or absence around an injurious body is dependent upon the latter's attractive or repulsive powers, upon a positive or negative chemiotaxis, as it is called. This simple fact was not grasped till attention was called to the approach in water of a certain fungus towards oak-bark, and its retreat from a substance like sodium chloride. Then other low forms of life, including the unicellular amoeba, were found to possess the same property of voluntary movement in approaching their prey or leaving a dangerous neighborhood. Observation speedily extended to the leucocytes or unicellular organisms in mammals, and their behavior in this respect towards bacteria.

If a capillary tube containing in its centre certain micro-organisms is planted under the skin of a rabbit it will speedily become filled with leucocytes, and in this instance the bacteria have positive chemiotactic properties. Other species of bacteria similarly implanted show negative chemiotactic properties,—they

repel the white cells from their neighborhood, and within certain limits this indicates that the animal in which this property is manifested will be overcome by the growth of the bacteria. But as it was observed that the fungus which was at first repelled by sodium chloride can in time, by deprivation of water, be made to approach this substance, so, as regards bacteria and the emigrated leucocytes, can a negative be made to change into a positive chemiotaxis. Recent study has somewhat modified this view, in that now it is known that all bacteria exhibit, at the outset of their parasitic existence, a greater or less amount of negative chemiotaxis. The more speedily this changes to positive the better for the host.

Let me give an example of this change. It has been stated that the vibrio of Metschnikoff repels the leucocytes of a chicken into which it has been introduced, and that this is followed by the death of the chicken. If, however, the chicken is previously rendered immune to this vibrio and is then inoculated with a virulent culture, the usual negative chemiotaxis is found to have become decidedly positive. The chicken which would ordinarily die survives, and indeed manifests but slight evidence of disturbance.

Metschnikoff was the first to show that the leucocytes which exhibit this positive chemiotaxis towards bacteria subsequently ingest and destroy them; and he believed that this destructive power of its leucocytes alone determined the survival of the animal. If the leucocytes were repelled from the bacteria and so could not absorb them the animal perished. The process is much more complex, as will be presently demonstrated. Comparative pathology has supplied most of the light on this subject.

The amoeba—a unicellular organism comparable to the leucocyte—approaches and ingests certain living organisms or diatoms which serve as its food. In the amoeba the diatom lies in a cavity containing an acid fluid, and by this is gradually disintegrated. But if certain other forms of minute life are taken up by the amoeba the digestive fluid in the vacuole is *not* acid, and the absorbed micro-organism does not perish, but grows and kills its host. There are found in the bodies of the entire animal kingdom analogous, unicellular, amoeboid organisms which originate in and belong to the tissues, named from their derivation mesodermal, and the discovery of analogous properties in these cells throughout the different animal species is the proof of what may sometimes be surmised but not always demonstrated in man.

Investigation has shown that the same laws prevail throughout the whole animal kingdom. Even the very lowest forms of life, in

which there is no nervous system and no closed vascular system, are afflicted with parasites, which are approached, ingested, and thus destroyed by the wandering, mesodermal, amœboid cells or leucocytes. If the parasites are not thus destroyed, the host perishes. A little higher in the animal scale the leucocytes begin to appear to be of more than one variety; they have different staining properties and different functions; some are phagocytic, that is, have the power of ingesting parasites, others are not so. In the mammalia the differentiation, as might be expected, becomes most marked.

Man is known to be provided with two or at most three classes of leucocytes, which, as they appear to have distinct duties, require some description. The other varieties are as yet mainly of scientific interest and need only be mentioned.

The hyaline leucocyte is phagocytic, exists most abundantly in and near the serous membranes, and has a single nucleus, which stains with basic, aniline dyes. The *finely* granular oxyphile cell is the ordinary pus-cell; it is oxyphilous, or stains with acid dyes, and is also phagocytic. The *coarsely* granular oxyphile cell, or the eosinophile leucocyte, stains with acid dyes, is polynucleated but not phagocytic. Its properties are not, strictly speaking, proved, but are inferred from what is known about closely analogous cells in lower animals.

It is necessary now to return for a moment to the theories of Metschnikoff. The discoverer of phagocytosis believed that this process alone controlled recovery after bacterial infection. That it is of great importance is shown by a simple experiment of much practical applicability. The guinea-pig is immune to inoculation with the spores of tetanus bacilli. Ordinarily the leucocytes approach and absorb them, and the animal recovers with but slight symptoms of disturbance. But if the spores are first encased in paper and then implanted in the pig, the leucocytes cannot come in contact with the spores, and the guinea-pig dies. A similar course of events can be supposed after infection of a mass of devitalized human tissue. The dead matter acts like a fence enclosing the bacteria. It prevents the latter from being reached by the wandering cells.

It is well known that debilitated persons are an easy prey to every kind of infection, and some of the earliest experiments clearly indicate that the general vitality of the individual is an important factor in phagocytosis. The chicken, for example, is immune to anthrax. The *spores* of this bacillus are taken up by the leuco-

cytes, but seem very resistant; they are difficult of digestion, and they survive in the leucocytes a considerable time. If now the bird is immersed in cold water and its strength thus impaired, the spores begin to grow and destroy the phagocytes; eventually they kill the chicken.

The white rat is similarly immune to anthrax. But if the rat is first made to turn a wheel until exhausted and is then inoculated, the result is the same in all respects as in the exhausted chicken,—death.

It was long doubted whether phagocytosis of living bacteria ever occurred; but now there is no question but that it does. It has been proved by numberless experiments; but the estimation of its importance has not been so easily settled.

One of the principal reasons for questioning the efficacy of phagocytosis as Metschnikoff understood it, was the fact that bacteria were often found to be dead before any leucocytes approached them. Then it was discovered that simple defibrinated blood had decided germicidal properties. The shed serum was actually more fatal to bacteria in many instances than that found in living tissues. Further experimentation demonstrated that the antiseptic substance of the serum was associated with the leucocytes; for an exudate rich in leucocytes was more bactericidal than the serum obtained by defibrination. This led to a study of these cells, and in the higher animals, as mentioned before, several distinct classes of leucocytes were identified. Kanthack and Hardy led the way in elucidating their functions. The frog is immune to anthrax. They found that anthrax bacilli suspended in frog's lymph were approached by leucocytes containing granules which stained with eosin. These granules were discharged and the bacilli apparently paralyzed or killed. The eosinophilous cells then withdrew, and were succeeded by mononucleated cells staining with methylene blue. These acted as phagocytes.

Thus something which had to do with the fluid part of the blood and tissues, or at least with the unformed elements, usually affects the bacteria before phagocytosis can occur. A well-known example of the power of this mysterious something is furnished by the clumping and loss of motility of typhoid bacilli in Widal's test for typhoid fever. The cell-free serum of an individual suffering from this disease, when mixed with a culture of actively moving typhoid bacilli, causes the latter within a few moments to cluster together in a mass, to lose their motility, and to perish.

All the antidotal serums are obtained from the blood of immune

animals, and are now known to contain two substances, one of which is bactericidal alone, the other both bactericidal and antitoxic; that is, it destroys the bacteria and in addition neutralizes their products. These substances are of complicated composition, and have been compared by Behring to the electricity in a magnet. It seems impossible to isolate or measure them. They are not analogous to a simple antiseptic, for if they were, the more of an immunizing serum which could be administered to a diseased animal the greater ought to be that animal's resisting power. Such is not the case. Neither do these bactericidal and antitoxic substances neutralize bacteria and their poisons like an acid does an alkali; for if a guinea-pig and a mouse are simultaneously injected each with an equal amount of immunizing serum and tetanus toxin, the larger animal will die while the smaller will survive.

The immunizing body or bodies, as there are more than one, have been given the name of alexins. They are probably derived from the nuclein of the wandering and fixed tissue cells. By injecting a vegetable irritant into the pleural cavity of guinea-pigs Büchner obtained a germ-free, purulent exudate, which was more bactericidal than normal blood. Kossel has proved that when the nuclein is separated the residue of the exudate loses much of its bactericidal power, but the solution of the separated nuclein still possesses it in an active form.

In this connection it is well to mention the investigations of Hankin. Following the lead of Kanthack and Hardy, he claims to have seen the granules in the eosinophilous cells of a purulent exudate collect on one side of these cells and then disappear. Coincidentally with this disappearance of granules from the cells the bactericidal power of the serum increased. Enough has now been established to prove that at least some of the cells produce in the presence of bacteria alexins or defensive proteids, which affect injuriously the bacteria before or in conjunction with the phagocytes.

As long ago as 1890, Tizzoni and Cattani stated that these defensive proteids were of the nature of an enzyme, or digestive ferment. The diatom contained in the vacuole within the amoeba which devours it is destroyed by an acid fluid in this vacuole. The anthrax bacillus is similarly seen to disintegrate within a vacuole in a leucocyte of frog's lymph.

If attenuated anthrax bacilli are implanted in a glass tube under a rabbit's skin, many are found to be dead before phagocytosis has occurred. But both those within and those without the cells, dead and disintegrating in both instances, present the same general

characteristics and reactions, and it is reasonable to suppose that the same agent destroys both the intra- and the extracellular organism. That this is a ferment seems to have been proved by Leber. He excited an aseptic, purulent inflammation by inserting a sterilized copper plate in the anterior chamber of a rabbit's eye. This exudate freed of cells was then found to be capable of digesting proteid material.

Another rather noticeable analogy of the alexins with the digestive secretions of the body is furnished by the reaction of the blood in the course of an infection. Many experiments show that an increase in its alkalinity favors immunity, and Calabrese has demonstrated, by inoculation of susceptible animals with cultures of gradually increasing strength, that the alkalinity of the blood increased with each inoculation, and that it reached its maximum when the animal had become completely refractory to infection with the ordinary amount of the most virulent bacteria. Infection of susceptible animals showed that there was at first an increased alkalinity, but that this very soon subsided much below the normal, and remained so till death. It is probable, then, that the germicidal bodies of serum are only soluble or can only act in an alkaline medium.

Thus it has been shown that the liquids of an exudative inflammation have a manifold action. As a great part of the elements concerned in the combat with bacteria come from the vessels, the importance of the latter's share in the process is manifest. There is an experiment which emphasizes this fact. If the common femoral vessels in one leg of a rabbit are ligated and the leg below the point of ligation inoculated with pus cocci, a violent phlegmon and possibly gangrene results. Inoculation of an uninjured rabbit with a similar amount of the same culture produces only a localized abscess.

The fluid part of the exudate, then, flushes out the sewers,—it carries off detritus,—it supplies extra nourishment to the cells designated for repair and protects the system from invasion. The endothelial cells have some selective power on what passes by them. They remove or add certain substances to the plasma, and in addition have phagocytic powers. They can put forth processes and seize and incorporate bacteria, which, if they have escaped the emigrated leucocytes, are thus hindered from entering the general circulation.

The nervous system is intimately connected with all that occurs. But its action so far as known is as mysterious as ever. Beyond a

few facts there is nothing definite. Histology has demonstrated that each cell of the heart has its particular nerve-filament, and as the heart is but a dilated vessel, it is presumable that each endothelial cell has its filament. Thus, with the aid of the central and peripheral vasomotor centres, the co-operation of the vessels in every inflammatory process is assured.

That the central nervous system does control to a certain extent the progress of events during a bacterial infection is shown by the following experiment.

Divide the vasoconstrictor nerve in one ear and the vasodilator in the other ear of the same rabbit. Then inoculate both ears with the erysipelas coccus. The ear in which the constrictor nerve has been cut rapidly recovers, while the other undergoes gangrene and perishes. If, now, in a fresh rabbit all connection with the central nervous system is severed by cutting all the peripheral nerves of the ears, and the ears are then similarly inoculated, the inflammation still appears and runs its course. Hence the central nervous system is merely an adjuvant in the various phenomena. It is simply a modifier of the process, important but not essential.

The same may be said of the temperature which accompanies an infection. Nothing very definite is known about it.

I have thus attempted to show that an inflammation is nature's response to an injury; that anatomically the difference between the reaction to a simple traumatism and the reaction to bacteria and their poisons is more one of degree than of kind. It is all an attempt to overcome a disaster, and the greater the disaster the more workmen—the more reparative elements—are required. When there is much *débris* to be cleared away a greater amount of labor has to be performed, and the parts concerned show great activity. In a simple incised wound there is but little destruction of tissue, and a few wandering cells are scavengers enough. A slight congestion of the vessels supplies most of them and enables the fixed cells to repair the damage. A large contused wound requires greater activity.

The solvent power of the cells is exerted upon the necrotic matter of an aseptic wound as upon bacteria and their products. This is manifested clinically by the aseptic wound fever, as it is called. It is the manifestation of the absorption of the ferments generated in the solution and removal of the dead matter in an aseptic wound. Micro-organisms provoke the same general response to the injury which they occasion. There is the congestion and swelling from the dilatation of the vessels and the exudation

of plasma. With this goes the emigration of the leucocytes. There is always an initial negative chemiotaxis, although this may be of so short duration as to be scarcely perceptible. It is probably to allow the bactericidal substances, the fluid part of the blood, to at least weaken the bacteria. I speak of it as though there were conscious effort in the cellular elements, but I mean it in an evolutionary sense. It is a derivation of ages of cellular growth, combat, and development. Some of the wandering cells first approach and excrete a ferment. This may or may not be the same as that secreted by the phagocytes, which follow and absorb and digest both living and dead particles. The bactericidal action of the unformed elements and phagocytosis are two processes which go hand in hand; there is much doubt about the relative importance of each. But the general consensus of opinion seems to place phagocytosis in the secondary position.

This property of phagocytosis is possessed by the amœboid leucocytes of the blood and lymph, by many fixed cells, such as the endothelial cells of the vessels and serous membranes, by the epithelial cells of the intestine, which can ingest the cholera vibrio, and by the cells of the splenic pulp.

As soon as the destructive agency permits, repair by proliferation of the connective-tissue cells begins and proceeds as in an aseptic wound. Over all, with the mysterious general vitality which seems to be centred in it, is the guiding influence of the central nervous system.

ARSENICAL NECROSIS.¹

BY OTTO E. INGLIS, D.D.S., PHILADELPHIA.

VERY little has been written in text-books for students upon the subject of the escape of arsenic trioxide from a cavity of decay upon the gum. A general warning to avoid such escape is alone given. Specific directions as to the treatment of any condition that may arise from carelessness in this direction are searched for in vain. Garretson recommends "repeated syringings, and gives the information that the sequestrum which is formed is seldom considerable." The writer has had the good fortune to be placed where a considerable number of such cases fall into his hands, and

¹Read before the Academy of Stomatology, Philadelphia, November 23, 1897.

while he can gladly agree with Garretson in that the sequestrum is seldom considerable, he feels that the information is vague and not sufficient unto the need of the anxious young practitioner or student who has such a case on hand, as the result of his lack of care or ignorance. Accidents will happen, and we should be provided with the antidote,—viz., a knowledge of how to proceed to neutralize or cure their effects.

First, let us consider how arsenic acts upon gum tissue. To this end the scientific experiments of Dr. J. H. McQuillen are worthy of attention. He took a frog, and to the web of its foot applied a grain of arsenic. The effect was noted by the use of the microscope. Dr. McQuillen says,¹ "For the first half-hour or so no apparent change was observable in the circulation: in a short time after this, however, the vessels sensibly increased in size and the circulation in rapidity of movement. The oval-shaped red corpuscles of the frog could be seen not only rushing through the vessels much more rapidly, but also in greater numbers than in the normal circulation. This continued for some time, and then the rapid motion of the circulation gradually decreased, the blood-corpuscles moving along slower and slower and apparently clinging to the walls of the vessels as if unwilling to leave them, and when doing so only yielding on account of the *vis a tergo*. The circulation went on decreasing until eventually complete stagnation supervened. This condition was not confined to the immediate vicinity of the spot on which arsenous acid was placed, but extended over the entire web. . . . The first frog died promptly, and arsenic was found in the muscular tissue of its heart. A second frog, which was treated in precisely the same manner, exhibited similar local inflammatory effects, but the inflamed part sloughed out, leaving an aperture in the web. It lived over a week in the apparent enjoyment of health, and then, through the carelessness of a domestic, it escaped." Dr. McQuillen inferred that arsenic could be classed as an irritant poison. We may infer from these experiments that arsenic is absorbed into the general circulation or prevented from so doing according to the degree of inflammation existing between it and the heart. We have further evidence of this in the application of arsenic for the removal of tumors. If a small quantity be applied systemic poisoning may take place, but when a large quantity is used, stasis is brought about so rapidly between the arsenic and the general circulation that absorption ceases because there is

¹ Dental Cosmos, vol. iii. p. 581.

no circulation to superintend absorption. Bearing upon the consideration of this subject is the fact that, according to the authorities, the injection of arsenic produces enteritis. There seems to be no direct evidence that arsenic is a chemical irritant, escharing after the manner of phenol, which combines directly with the albumen of the tissues, although the statement has been made that arsenite of albumen is formed. In an attempt to determine this point the following experiments were performed. With a teaspoonful of fresh egg albumen, ten grains of arsenic trioxide were thoroughly triturated in a mortar at a temperature of 98° F. No coagulation took place at any time during a week or more, while the arsenic gradually settled to the bottom of the mortar, leaving clear albumen supernatant. A high temperature would undoubtedly have coagulated the albumen. A second experiment was made, the arsenic being ground into the albumen and then three times the volume of water added and the mixture again triturated. A magma composed of arsenic and albumen settled to the bottom of the mortar. The question now being whether the coagulum was due to the arsenic or to the water, a third experiment was performed. This consisted in taking one part egg albumen and three parts water and triturating. A flocculent coagulum was at once formed which, lacking the weight of the arsenic, did not settle.

We can only conclude that the coagulum formed by the water held the arsenic suspended in its meshes. The experiments are offered for what they are worth. So far as seen arsenic must be classed with irritants which act through the inflammation they are capable of producing.

Biddle¹ states, upon the authority of Scolosuboff, that in arsenical poisoning, if in fresh muscle one part of arsenic be found, the proportion in liver is ten and eight-tenths parts, brain, thirty-six and five-tenths parts, and in the spinal cord thirty-seven and three-tenths parts.

This would seem to show an enormous selective affinity of the drug for nervous tissue. May we not justly infer that this selective affinity accounts for the hyperæmia of parts distant from the seat of application (as in the web of the frog's foot). In other words, that the drug after absorption exhibits an affinity for the vasomotor system producing paralysis of the vasoconstrictor nerves. This being permanent, the capillaries are unable to contract and complete stasis results.

¹ *Materia Medica and Therapeutics*, p. 472.

When arsenic escapes upon a gum, the first effect is probably the irritation of the vasomotor nerves and their subsequent paralyzation. This causes atony of the vessels and in consequence stagnation of blood ensues as may be seen by the turgid condition of the gum festoon.

Later, this festoon becomes of a dirty yellow color, which signifies that it is gangrenous. The extent and direction of the necrosis depend upon the amount of arsenic which has leaked upon the gum. As the amount is generally small, systemic poisoning cannot usually result, although it is probable that some arsenic is absorbed into the general circulation. When leakage of arsenic takes place from a tooth-cavity, different parts are attacked, according to whether the arsenic is confined against the gum septum or allowed to diffuse itself.

In the writer's experience, the mixture of arsenic and creosote, as furnished in the ordinary "nerve paste," has produced more serious results than the pastes in which the arsenic is distended with morphine or other admixture. This is another evidence of the fact that effect is in proportion to the quantity of arsenic allowed to escape.

The following may be held as expressing the amount of damage done:

1. Necrosis of gum septum.
 2. Necrosis of gum border encircling one or more teeth.
 3. Limited necrosis of bone directly underlying these parts.
 4. Extension of the area of necrosis along the pericementum, with loosening and bloodless loss of tooth.
 5. Necrosis beginning at some high portion of the alveolus, as when arsenic is applied through a perforation.
 6. Necrosis beginning at the apical foramen owing to the forcing through of arsenic.
 7. Necrosis of tissues of the cheek or lip.
- Let us consider these in their proper order.

NECROSIS OF THE GUM SEPTUM.

This limited amount of necrosis could of course only occur as the result of leakage of a very small amount of arsenic, or as limited by prompt surgical interference. It will be evidenced in its first stage by a turgid condition of the gum between the teeth. This will be succeeded by a yellow slough. The part should be thoroughly syringed to remove any arsenic present. The tooth-cavity may be opened, the pulp removed, and the canals filled.

The slough should then be curetted away with a large spoon excavator or small lancet. Antiseptic gauze is then to be placed against the gum between the teeth, and the patient is to be directed to syringe the part with three per cent. pyrozone or one to two hundred solution of potassium permanganate in water. Regeneration may be expected.

NECROSIS OF GUM BORDER ENCIRCLING ONE OR MORE TEETH.

This condition occurs as the result of leakage of a considerable amount of paste, the same not being confined to the dental interspace. It is apt to occur when very fluid preparations have been used in undue quantity. It is peculiar to fluids to follow the festoon of the gum. This may be noted when, during excavating, the gum has been made to bleed. The blood will trickle backward, following the line of the festoons. The same will also be noted with carbolic acid; if applied in excess, the festoons will be eschared. As carbolic acid is a common menstruum for arsenical pastes, it is not necessary to say more on this point.

This would seem to be an especially dangerous manner for the arsenic to distribute itself, as indeed it is, especially in the inferior jaw, where gravitation favors its retention within the gum festoon. The pericementum having its attachment at the festoon is readily attacked and the tooth lost. In the superior jaw the danger is seemingly not so great. At any rate the same disastrous results have not been observed. The dead tissue should be curetted away, the part kept aseptic, and regeneration will usually take place.

NECROSIS OF BONE DIRECTLY UNDERLYING THE SOFT PARTS.

When a limited amount of leakage has caused necrosis and the same is neglected, a small portion of the alveolar process becomes necrosed and forms a sequestrum. This may persist in its position for many months after separation, owing to the peculiar retentive shape of the bone. A certain amount of liquefaction into pus may result, but, as a rule, in from three to six weeks operative procedures are necessary. The sequestrum should be divided at its middle portion and removed in two pieces.

This death of bone is due probably to the loss of its source of nutrition,—viz., the periosteum, and possibly also to the entrance of organisms to the part. These produce a septic gangrenous condition against which the vital tissues react. The result is demarcation of the bone and its sequestration by a line of pus.

When the bone has been lost, it is found that the adjoining teeth

are denuded, their pericementum to an extent nearly corresponding to the size of the sequestrum. Some regeneration will take place, but there will also be more or less deformity resulting from the loss of bone tissue. It has been the experience that when a quantity of arsenic has been used larger than will produce a limited death of bone the pericementum is so affected that the loss of at least one tooth results. When the process has been affected, as will be indicated by its insensitiveness at points underlying sloughing gum tissue, it should be gently scraped or burred away until sensitive tissue is reached. The part should be frequently syringed with pyrozone and the result awaited. If nothing else be accomplished by this treatment, the arsenic at least will be removed and the extent of necrosis, in all probability, limited. The following is a description of the case which resulted in the largest sequestrum of process without loss of the tooth that the writer has seen. The application was made to a mesio-occlusal cavity of a molar in January, 1897. In about three weeks a sequestrum of the septum about one-third inch deep was taken away. The lingual and buccal margins of the process were affected about alike.

The case was seen again, November 1, 1897. The gum had receded, exposing the cementum from the middle of the cervix on the distal root to a point about one-quarter inch below the cervix on the mesial root.

The tooth was somewhat looser than normal, due probably to chronic periodontal irritation with food fermentation, calculus, etc., as cause. The gum edge was somewhat thickened.

Dr. J. H. McQuillen¹ instances a case in which by syringing with tepid water and applications of creosote and iodine he succeeded in saving two bicuspid, but was compelled to remove a considerable portion of the process, in consequence of which there was considerable disfigurement.

**EXTENSION OF THE AREA OF NECROSIS ALONG THE PERICEMENTUM,
WITH LOOSENING AND BLOODLESS LOSS OF THE TOOTH.**

This may result from confinement of arsenic against the septum or from its distribution around the festoon. These are the cases in which accrue results causing much chagrin to the operator. Nothing can be more disastrous to one's reputation than to bring about a deformity where a simple remedial measure was intended. When the arsenic begins its action upon the pericementum at the gum

¹ Dental Cosmos, vol. xiii. p. 394.

line, whether between the teeth or at the festoon, and the case is neglected for a few days, it may rapidly destroy the membrane. The tooth becomes loose and sore and may in some cases be extracted with the fingers, or even in the attempt to remove a temporary filling.

The surrounding gum tissue is not always as much affected as one would expect. After the tooth is removed the alveolus is found bare, bloodless, and septic. There is no doubt of its septic condition, as the odor of the tooth will resemble that of a tooth extracted for phagedenic pericementitis. The fermentation of stagnant saliva and serum will account for this. Were the case neglected at this point, it is probable that the alveolar cortex or process enveloping the tooth will be thrown off. A specimen is presented, taken from the mouth of a boy of fourteen years. Arsenic was applied to a distal cavity in a superior first bicuspid. The gum septum necrosed. Free curetting was indulged in, but the pericementum had been so profoundly affected that the tooth loosened and was extracted. Later the envelope of process was taken away.

Later, Dr. J. Foster Flagg¹ mentions a case in which a second superior bicuspid and first molar were lost, together with all the intervening process, as the result of a persistent application of arsenic to a distal cavity in the bicuspid. Leakage occurred.

Another phase of the condition was presented in the case of a young girl fifteen years of age. The application was made to a left inferior second molar. The pericementum necrosed, and the tooth was extracted without the loss of a single drop of blood. The apices of the alveoli were drilled away to healthy bone, in order to avoid any possibility of extension of the necrosis in the direction of the inferior dental canal. The writer then decided to experiment upon the case, and directed the patient to make application of three per cent. pyrozone upon cotton three times daily. The case was seen twice a week for two months, after which the patient was discharged cured.

There seemed to be a molecular death of the cortical bone upon the exposed side, which the pyrozone removed. Upon the side of the cancellated bone vitality was maintained. The cortex became thinner and thinner, until granulations began to spring through the walls of the alveolus. No doubt there was some absorptive action upon the bone by the healthy tissues. Such action is not uncom-

¹ Dental Cosmos, vol. x. p. 685.

mon under other circumstances, as may be seen upon the roots of some chronically abscessed teeth, or upon planted teeth.

The foregoing treatment was merely experimental. The removal of the cortical bone by surgical means (*i.e.*, with a large bur in the engine) and the induction of tissue regeneration is preferable.

NECROSIS BEGINNING AT SOME HIGH PORTION OF THE ALVEOLUS, AS WHEN ARSENIC IS APPLIED THROUGH A PERFORATION.

The writer has seen several cases of this sort. When so applied, the necrosis extends in all directions, following the pericementum and attacking the bone. If promptly discovered and treated by removal of the dead portion, some hope may be entertained of retaining the tooth, but only at the expense of loss of tissue. If neglected, not only one but two teeth may be lost, this being dependent upon the quantity of arsenic applied.

Perforation by drilling is not always easy to differentiate from a partially devitalized pulp. In doubtful cases it is better to avoid the use of arsenic. The following is a description of the only case occurring in the writer's private practice:

One busy day a lady requested treatment of a left lower second bicuspid, which had been in the hands of an incompetent practitioner. The patient could give no history, except that much pain had been inflicted. Examination revealed what seemed to be a complete exposure of the pulp, but which results proved to be hypertrophied gum. The usual application was made, and the patient dismissed for a few days. Upon her return a necrosed condition of the septum between the second bicuspid and first molar was discovered. The bicuspid was opened and found to be perforated upon the distal face of the root. The opening was a line in diameter, and made evidently with the intention of opening the root-canal. The case was cured by extraction of the bicuspid and curetting the parts. The specimen is exhibited here, and it will be plain that any one would be warranted in following the treatment of the supposed pulp as was done.

In this connection it is well to call attention to the liability to this accident in cases of gum proliferation through a carious perforation of the root. The practice of establishing the diagnosis before attempting to apply arsenic is evidently correct.

NECROSIS BEGINNING AT THE APICAL FORAMEN.

There is no doubt in the writer's mind that many cases of chronic periodental irritation have occurred as the result of careless

broaching. In all cases where paste has been applied, especially when placed in the root, the arsenic should be removed by alternate broaching and syringing. The writer has never been able to positively connect arsenic with apical irritation, but has suspected its occurrence after the manner indicated in a number of cases.

A unique case has been reported by a professional friend. He made an application to a pulp, but, finding it only partially devitalized thereby, he applied cocaine by cataphoresis without removing the traces of arsenical paste from the tooth.

A slough of three lines' diameter appeared over the apex, but was gradually thrown off by tissue regeneration beneath. Whether this result was due to cataphoric action or to mechanical conveyance of the arsenic to the apical space is not clear. This history may cause us to infer that there exists toleration of a certain amount of aseptic slough by the tissues of the apical space. We may bear in mind to what extent the escharotic action of zinc chloride and carbolic acid are tolerated by these parts.

NECROSIS OF THE TISSUES OF THE CHEEK.

This simulates quite closely the ordinary aphthous ulcer, is usually slight, and requires little attention. If extensive, however, it should be treated upon the principle of exciting an inflammation to check the absorption of the drug. Free cauterization with argentic nitrate succeeded admirably in a case of deep penetration of arsenic into the tissues of the buccinator muscle at a point near the lower third molar. The treatment of arsenical necrosis of any magnitude with ferric hydrate has not resulted happily for the writer; perhaps the fault may lie in the difficulty of its maintenance in position. It is difficult to understand, however, why it should be expected to more than remove the unabsorbed arsenic from a part, inasmuch as dead tissue lies between it and the advancing arsenic.

It would be an omission, having stated the ill effects of arsenic when allowed to escape upon the gum, not to mention some means whereby leakage may be prevented. The quantity of paste used should be as minute as possible, and should be carefully sealed in the cavity. In accessible places, where the rubber dam can be applied, and especially in the lower teeth, the application may be made upon the under side of a small piece of letter-paper, and thin zinc phosphate flowed over it. The method is necessarily of limited application, owing to the unmanageable nature of the zinc phosphate. Temporary stopping is a material much lauded for this

purpose. It should never be used in cavities the margins of which go beneath the gum, unless the rubber dam can be applied. As it requires a certain amount of pressure, which, if exerted upon the arsenic, will either insure its escape from the cavity or cause compression of the pulp, a cap of metal should be placed over the application. Pressure may then be exerted at will. Gutta-percha is a material too difficult of proper use to be relied upon in preference to temporary stopping.

A method employed by the writer is to first build in the cervical portion of the covering; next to make the application and cover it with a pellet of dry cotton; then to build in the remainder of the covering. Where cavity margins are in dangerous proximity to the gum, or where mechanical retention of the covering filling is but slight, and where the rubber dam cannot be applied, nothing can be better than an amalgam made from an alloy of forty parts silver, fifty-five parts tin, and five parts zinc, and known as "Flagg's facing." It absolutely does not leak, but probably expands, causes no pressure in its insertion, does not discolor within a considerable length of time, and is easily removed with an excavator. When desired, it may be relied upon for any reasonable period to maintain its position, even under the stress of mastication.

To illustrate: A right lower third molar had a large buccal cavity with the cervical margin under the gum, which also slightly overlapped it. The exposure of the pulp was complete, and business necessity rendered an immediate application desirable.

Though this represents, perhaps, an extreme case, yet the writer's experience is that in the clinical service frequently, and in private practice not so very seldom, cases of quite as puzzling a nature have to be dealt with. Facing amalgam, handled more or less in the manner about to be related, may be relied upon.

The cavity was first cleansed, and undercuts made along the mesial and distal walls. Disinfection with three per cent. hydrogen dioxide followed. A pellet of cotton was laid upon the pulp, and a small portion of soft amalgam was inserted back of the flap of gum and pressed outward, carrying the gum with it. The cavity was then filled with the amalgam. An excavator was now used to cut down through the buccal aspect of the filling upon the cotton, which was then removed. Arsenic upon cotton was placed upon the pulp, and a small portion of amalgam used to seal the tap. When it is desired to remove the covering, a dentated bur is passed into the tap, and the filling easily divided in two, when the halves may be crushed together. Ordinarily a small cervical portion may be left for the

support of the clamp during treatment of the case. When this is completed it should, of course, be replaced by other material.

When the exposure is found upon a surface which is inaccessible by any ordinary method, as when a cervical cavity exists upon a distal face of a molar, what is known as a "pocket" should be made. This is a drill-pit made in the direction of the horn of the pulp, and preferably, for pathological reasons, towards one that is not exposed. Sometimes the pulp may be very closely approached. Arsenical paste is then sealed in the pocket, while soothing medicaments are to be placed in the cavity of decay. Of course, cataphoresis may be considered in any of these conditions, but with that we are not at present dealing.

Within the past few days, and since this article was written, the writer was consulted by a gentleman from Demarara, who desired some fillings made.

In the course of the operations mention was made of the excellent quality of his teeth, and sympathy expressed for the loss of every tooth back of the first bicuspid upon the right side of the lower jaw. He said he had with his fingers removed them all at once, together with the bone surrounding them, as the result of an application of "something to quiet an aching tooth." There was a very flat and greatly depressed condition of the ridge where the teeth had been lost, which seemed to bear out his statement. If there be truth in his story, we have no reason to doubt that arsenic was the medicament used, probably in considerable quantity. We may also learn to what extent necrosis may result without loss of a portion of the maxilla proper. The writer does not vouch for the case, but gives the facts as they were related to him. It may serve, at any rate, as a warning, and at the same time as an encouragement should an accident occur.

X-RAYS.

BY DWIGHT M. CLAPP, D.M.D., BOSTON, MASS.

A LITTLE over a year ago, in a talk with Dr. William Rollins, of this city, I became interested in X-rays. Since then I have worked with it more or less constantly, and I give here a very few examples, of the many I have, showing the utility of the discovery to us in the general practice of dentistry.

FIG. 1.



FIG. 2.



FIG. 3.



FIG. 4.

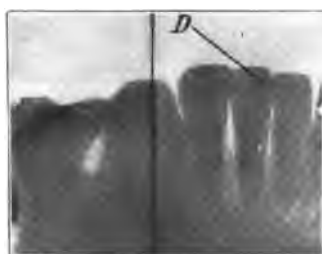


FIG. 1.—Patient twenty-three years of age with temporary cuspid still in place. X-ray shows the permanent cuspid embedded in the jaw, in a nearly horizontal position. The left side of this mouth is almost an exact duplicate of the right.

FIG. 2.—Showing a broken Gates-Glidden drill, which had been forced through the apex of the root of central. Discovered by use of the X-ray, after having remained in the jaw more than a year, causing severe abscess. The light spot around the drill shows considerable breaking down of tissue. The piece of drill removed was three-eighths of an inch long.

FIG. 3.—Showing fracture of inferior central, near the apex of the root, caused by blow from a polo mallet.

The picture was taken on July 21 last, a day or two after the accident. This and several of the adjoining teeth were quite loose, but there was no soreness nor signs of inflammation. A gold splint was made and cemented over the tooth, and worn until about the 1st of November. At this time the teeth were quite firm, showing in a strong light no signs of devitalized pulps nor any other trouble.

FIG. 4.—This was taken on November 11. It gives no trace of the fracture. There appears to be a slight thickening, as though an osseous deposit had taken place. (The negative shows this better than the reproduction.) Has there been a union of the fracture?

The patient, a young and vigorous man, has gone to the Hudson Bay country for a winter's sport, hunting big game. When he returns in the spring I hope to get more definite information regarding the condition of the tooth.

I use a double-plate static machine, driven by a sixth horsepower motor. The power to drive the motor is taken from the street current.

The exposures are from two to three and one-half minutes, at a distance of from eight to ten inches. The films are one and five-eighths by one and one-quarter inches, wrapped in three thicknesses of non-actinic paper.

PRESIDENT'S ADDRESS.¹

BY GEORGE H. CHANCE, D.D.S., M.D.

It is not my intention in this address to give you a long discourse on the rise and progress of modern dentistry, however profitable it might or might not be, nor to descant upon any particular phase of the science or art of our profession, but rather to throw out in a promiscuous sort of way a few suggestive thoughts for your careful consideration, and should some things be said as I proceed which may sound harsh in your ears, I trust you will pardon the plain language and consider not the letter but the spirit of the address, as well as make a proper application of the moral it is intended to convey.

It will doubtless be conceded by the reading and thinking members of this Association, and we should all be readers and thinkers, that while as individual dentists we may consider ourselves "up to date," yet as an organized body of professional workers we are very far behind our brethren in that respect in perhaps almost every other section of the country. Nor will it do in this age of steam and electricity to say, by way of excuse, that we are handicapped by distance from our *confrères*; that we have not the same facilities for study and original investigation which they possess; we cannot say that climatic influences have changed the character of our text-books, our journals, and other periodicals of the profession. What is it, then, which keeps us in the background of the progressive dental States? Have we no original ideas, no scientific theories of our own to bring to the light, or no inventive mechanical ability, from out of some of which Oregon may be able to set up one little "mile-stone" for the guidance of others on the road of progressive professional life? or are we ready to admit that the Oregon dentist knows no road to professional life; that he is a mere dental huckster, selling his wares for whatever he may be able to get from any shopping purchaser who may happen along? or will we consent that our professional brains have become so dull that we can gather no inspiration for an organized professional advance in this God-given land, with her snow-capped peaks, her ever fertile valleys, her mineral rocks and rills, her streams and wooded hills, her fruits and flowers, her schools and colleges, her churches and

¹ Read before the Oregon State Dental Association, October 14, 1897.

public libraries, her growing cities and thrifty farms, her manufactures and her commerce?

I think not; yet we cannot gainsay the fact that there exists an apathy and lethargy among Oregon dentists which ought not to be. What are the causes, and shall we try to find the answer? It is a trite saying that "God helps those who are willing to help themselves;" so with this quotation in our minds let each one ask himself not what the past year has done for him in the way of dollars and cents, for though a part, it is not all there is of dentistry, but rather what he himself has done or has attempted to do for the advancement of his profession. Whether or not he has been acting the part of a sponge, absorbing the thoughts, the ideas, and the work of his fellow-practitioners without giving out anything in return, or whether without undue squeezing he has himself contributed something of his own to the general fund of dental knowledge, or does he, like a stationary dead stick or stone, remain exactly in the same spot he occupied one year ago, except that he is covered with a little more moss, and is one year nearer the fossil stage of his existence?—these are pertinent questions which each one can answer to himself for himself, and if answered in accordance with the facts, I think we will be able to get at some of the causes of the trouble with which the average Oregon dentist is affected; then again, how little any of us would or could know if each one were left, without outside aid, to his own inner resources, and, therefore, how much we are indebted to others for our knowledge, our acquirements, and the manifold blessings we enjoy through their efforts in our behalf, and though each one's contribution may at the time seem but little in itself, it is in the adding of the mites of each that we reach the aggregate of all human knowledge.

Then do not forget that such meetings as these are for the general good, and with the proper effort on the part of each may be made profitable to all. Now, time, perhaps, will not permit us at this meeting to examine all the fruit-bearing trees of our professional knowledge and experience, but we can have, if we will, a few seed-thoughts that may be planted and co-operatively cultivated for future fruit-bearing. To generate these seed-thoughts may at first glance seem to be difficult, but look about you and then learn how little it takes to generate a seed-thought that may ultimately become a fruit-bearing tree if the mind be allowed to run in the proper channel. It was nothing but a falling apple that generated in the mind of a Newton the seed-thought of the law

of gravitation, and naught but a flying kite which gave the seed-thought of the electric current to Franklin, and it was the boiling water in a teakettle which gave Watts the seed-thought of the invisible power of steam. And what was it but the pustule on the finger of a dairy-maid which gave the seed-thought of vaccination to a Jenner. Even the dental engine which dentists use, in its various makes and forms, is but the development of the seed-thought of a sheep-shearer; and so I might continue on, speaking of other seed-thoughts planted by past and present benefactors of the human race, which, by proper cultivation on the part of others, have become full fruit-bearing trees of knowledge and wisdom of which we are all partakers. But greatest and best of all these seed-thoughts was that of the "Fatherhood of God and the Brotherhood of man," planted near nineteen hundred years ago in a few faithful breasts by the Christ of Calvary, which by careful co-operative cultivation has become the splendid fruit-bearing tree of a Christian civilization, and which by its uplifting power through its gentle and benign influence has made possible the development of all other seed-thoughts planted and cultivated for the benefit of the human race; but without the all-important principle of co-operation these seed-thoughts, or, to change the figure, germs of progress, would have died at the moment of their birth, entirely changing the divine order of things from life and progress to retrogression, disintegration, inertia, and death.

I would have you, therefore, consider well this principle of co-operation if you desire to advance the standard of dental progress in the State of Oregon, for it is this same principle of co-operation in successfully developing the seed-thoughts of others which has made dentistry the profession that it is to-day, honored and respected by the intelligent and progressive of every community in the land. Then it becomes self-evident that in order to succeed in the fullest sense as individual dentists we must in the very nature of things co-operate with each other; but this principle of co-operation implies compatibility with and co-ordination of the several parts of the body before there can be full and perfect co-operation in any direction. Now, what are the facts so far as the great membership of the dental profession is concerned? Are not some of us afflicted with incompatibility? and does not the disease sometimes manifest itself in a lack of that true professional spirit which ought at all times to guide us in our actions towards each other? Do we not sometimes use unkind words when speaking of a brother practitioner, when kind words would be better for him and more credita-

ble to us? Are we always careful to try to sooth the ruffled feelings of a scolding patient of a brother dentist for an alleged error or mistake attributed to said dentist, but through the sin of omission. Do we not sometimes rather aggravate the case against the brother, however unjust the charge, by not offering a kindly suggestion that the patient return to the offending dentist for explanation or correction of the alleged error.

Now, it has been demonstrated time and again that when such cases occur,—and they have occurred in other places besides Oregon,—that while all parties in interest must necessarily suffer, yet by the law of reflex action those who are afflicted with this form of incompatibility usually suffer the most, for the very good reason that our patrons are very much like ourselves, susceptible to outside impressions, be they good or bad.

We have doubtless all seen and have listened to the sounds emanating from the machine known as the phonograph. We also know that if discordant sounds are spoken into the machine that the same identical sounds will, under the proper stimulus, be discharged therefrom; and so, it seems to me, that where bad impressions are made by a dentist, either as regards himself, a brother dentist, or the profession at large, upon human phonographs in the form of dental patrons, such impressions are apt to become indelibly fixed in the minds of such persons, and perhaps can never be entirely eradicated, notwithstanding the utmost caution and the very best service one may be able to render them thereafter.

Before closing this address let me give you one or two snapshot pictures of some of the incompatibles. Here is one: a would-be patient, a gentleman, all smiles and affability, enters your dental office, and after being seated in the chair, proceeds to pour out his "tale of woe," how that Dr. — has had charge of his mouth for some time past; but he is sorry to have it to say that Dr. — has not given satisfaction; that you have been highly recommended to him as being one of the best, if not the best dentist in the city, and are very reasonable in your prices. He therefore desires to make an appointment with you at as early a date as you can give him, as he is a very busy man and his time is limited. Now, should any such individual visit your office, make the appointment, but first see that "wicked dentist" before operating, and ascertain if there is not an unpaid account standing against the aforesaid would-be gentleman patient; if so, govern yourself accordingly, as it may save you from a fit of profanity, labor wasted, and the loss of other and more valuable patients.

Here is one showing the "Uriah Heeps" of the profession, that class who are always "so very humble" that they never say anything to their patients that would sound naughty about a professional brother, but when canvassing the merits of another dentist who is not of their ilk, they merely shrug their shoulders, heave a deep sigh, and roll up their eyes in mock horror, to express their abhorrence at the wickedness of dentists in general, their own dear humble selves being the only exception. This one shows the "teeth without plates," dental vampire, who, like his prototype, mutilates and destroys in order the better to enable him to sell his false wares for whatever he can wrest from the pockets of his innocent victims, and this last one, from which most of the incompatibles originate, are a lot of cunning ignoramuses with little or no preliminary or special training, but depending entirely on their cunning to aid them in slipping by the sleepy sentinels who are supposed to watch and guard the gate-ways which open into the dental domain. Now, these are no fancy pictures, but true portraits taken from dental life as it exists, not only in Oregon but elsewhere in this country.

Permit me to impress upon the mind of each one present that as members of the Oregon State Dental Association we constitute an integral part of the great working force of American dentists, and as such integral part should act in harmony with the body of professional workers in other sections of the country, and this we may do by eliminating as far as possible from our own natures all that is incompatible with successful co-operative work, never taking part with the guerillas of the profession, but ever and always making legitimate war upon them until they are compelled to abandon their methods or be driven out from among us.

Thus and thus only can Oregon be brought into the front ranks of the progressive dental States, and thus only shall we be able to elevate ourselves, and by so doing secure the esteem of all the best elements in the profession, as well as gain the full confidence of the general public in us as professional men, while at the same time each co-worker will receive his full equivalent of such mutual co-operation.

THE FUNERAL OF THE AMERICAN DENTAL ASSOCIATION.

BY DR. G. ALDEN MILLS, NEW YORK.

THE Scripture tells us that it is better to go to a funeral than to a house of feasting. The death of the Association is announced. Death, as many look at it, means the end. Nonsense; death is only a change; something dies that a better condition may be evolved. Because this Association ceases it does not follow that it has not generated a progeny that has not enough of good purpose to enact something that will serve a larger good for the coming profession. The election of president at the last session was a gratification, but we think this officer has let a shadow of the funeral fall now that the change has really come.

While the President said much that is recognized as truth regarding the legislative web which has been spun around us, yet it is not feared but that there will be an infusion of energy that will demand a quickly modified state of things throughout the entire union of States, or the whole fabric will be cast to utter destruction. No words are too hot for denunciation of such dastardly domination which stares a noble humanitarian calling in the face as the unjust legislative spirit. It is a menace to all that is good or progressive. No profession can advance against a selfish aristocracy. I marvel that while many have seen this, they have shrugged their shoulders and bent their tender heads to screen themselves from a possible impropriety should they demonstrate the courage of their convictions.

It is none too soon that the schools of education in dentistry are awake to the danger, and a move on their part to throw off the imposed shackles will give a healthy impetus to the whole body. In my opinion such a determination would do more to awaken the latent energies that are so indifferently looking on in face of the cry, "Why do not the societies increase in membership?" The dentists see, just what so many in the lower strata of society see, or imagine they see, that spirit of dominating, selfish power brandishing their bludgeons over them.

While the editor of the *INTERNATIONAL DENTAL JOURNAL* has, perhaps, unthinkingly permitted much in the editorial of the September number not wholly in accord with my judgment, there is much that is worthy of perusal by all thinking men, and endorse it by bringing their thoughts into active work.

Should there be a united action during the coming year showing a determined purpose to call a halt and say, "Thus far and no farther" shall this dominant spirit of the few retard the growth of the majority, who can count among their number many of sincere purpose? I am prepared to declare that the mischief lies between education and arbitrary legislation. There are not a few of other issues, but these would quickly be disposed of could the major issue be met.

The schools are entitled to our respect on general principles. They have done nobly considering all things, and it is believed that at heart the impulses are for the best good of our worthy calling. I would say to the schools, take up the gauntlet and let the mass of our profession see there is a righteous spirit in existence that can only be productive of good. Truly, we are in a crucible, and the real metal will come out of right doing and thinking.

In my view it may prove a providence that there is a degree of uncertainty prevailing concerning the outcome of the newly formed body, the National Dental Association. There are better things ahead for the brave.

Abstracts and Translations.

SOME FACTORS WHICH CAUSE ERUPTION OF THE TEETH.

BY DENCER WHITTLES, L.D.S. (ENG.).

MANY causes have been assigned to account for the eruption of teeth, and among them may be enumerated lengthening of the root, contraction of the dental sac, bone currents, and more recently the blood-pressure has been brought to bear upon the expulsion of these organs from their bony crypts.

Evolution throws much light upon the most complex structures, if we compare present highly organized creatures with the lower forms of life, which may only possess lips or stomata for the prehension of food, and of course these openings would possess some form of touch corpuscles contained therein, and so in process of time these, owing to the altered environment and change of habit, become specialized and hardened by calcification, and which epidermal appendages we call teeth.

The sources of tissues which afterwards become calcified are two,—namely, epiblast or *ectoderm*, and mesoblast or *mesoderm*. The former tissue covers the whole surface of the body and those tracts which have communication with the outside of the body.

Some may take exception to this statement that all epithelial tissues are without the body in their normal position, just because nervous matter is epiblastic in origin. I surmount that difficulty, perhaps wrongly, by viewing the whole arrangement of the central nervous system doing its utmost to get outside by sending the innumerable peripheral nerves to the surface of the body, and its ganglia being only kept in by the hard, unyielding walls of the cranium and spinal column, although its early presence has produced the many foramina for the exit of its numerous branches which are maintained until the bones turn again to earth.

Mesoblastic or connective tissue-forming element of the blastoderm gives origin to the whole of a tooth with the exception of the enamel and its skin and the nerves of the pulp (or a better term would be “dental papilla”).

It is a generally accepted theory that teeth will not form without the inflexion of the Malpighian layer of cells, although no enamel may be formed on the surface of the dentine; but the epithelial cells will be there, so that the presence of enamel on a tooth (as a foreign body) is insufficient to account for its being ejected to the free surface of the oral cavity or body. One of the earliest examples of an inflexion of epithelial tissue takes place in the human ovary, which may be described briefly as consisting of fibrous tissue, with blood-vessels, etc., and is covered by a layer of columnar epithelium. The ovules, or immature ova, are developed during foetal life from cells which come from this germ epithelium, as it is called. They get into the interior of the ovary by a process of down-growth of this germ epithelium and subsequent isolation. As the ovule matures it sinks deeper into the ovary, but in the later stages it comes quite close to the surface, and eventually the Graafian follicle ruptures, and the mature ovum escapes from the ovary, to be conducted down the Fallopian tube to the uterus. Its ultimate destination, whether impregnated or not, is the *exterior*. The whole process bears analogy to the inflexion of the oral epithelium, with the subsequent cutting off of the tooth germ and final eruption to the surface.

The developement of the ovary shows the intimate bearing which epithelial tissue has upon connective tissue. The *first sign* of the ovary is a heaping up of epithelium at one place. Subse-

quently, underneath this arises the connective tissue of the ovary, and this forms the bulk of the organ, while the epithelium covers its exterior with the exception of the ovules, which have come to take a place inside the ovary by a process of ingrowing and isolation.

To make myself clear, it will be advisable to consider the mode of growth of a tooth after the cap of dentine has formed until the completion of the root, and which may be described as dental anabolism or constructive metabolism; and, secondly, the removal of those tissues around the dental germ to allow of its escape, which may be conveniently called dental follicular catabolism or destructive metabolism.

It is not necessary for me to weary you with a description of the various dentines, so let it suffice for me to draw your attention to the presence of a number of large cells (larger than seen elsewhere) containing proportionately large nuclei, at the base of the dentine papilla, from the sides of which arise the two cornua of the dental sac. These, you will observe, contain nuclei almost as big as themselves, which, taken together, suggest that they are capable of great metabolic energy. To my mind, these are the cells which propel the tooth forward until the crown is quite through into position in the case of a simple rooted tooth, or in the case of a tooth of persistent growth is being kept constantly moving forward. It is not necessary to mention those teeth whose attachments are by means of a fibrous membrane or bony ankylosis, as these two are only modifications of the simple socketed tooth, like those of man.

I believe it is generally admitted that low-formed cells, generally of the round variety, possess much activity, and to give a homely simile from the vegetable kingdom,—*e.g.*, fungi,—these are capable of displacing very heavy stones, simply by cell-division, also splitting of the bark in trees.

To return to these deep, large, papillary cells and the power of force shown by them, let me remind you what occurs if by chance opposing incisor teeth of the rodents become injured, and which condition is illustrated in the current number of the *Strand Magazine*, is not at least so infrequent as stated there. Our college specimens show where the inability to obtain food resulted in the death of the animal. If from mechanical cause, such as an overcrowded mouth, want of symmetry between teeth and jaws, a tooth is unable to erupt until the root is complete, there is much less probability of its getting into a proper position, unless the alve-

olus by an interstitial growth can remedy the want of propulsive force, as instanced in some cases where temporary teeth have been retained, and yet come into occlusion with the permanent teeth; and again, we all know that teeth with stunted roots do erupt, and when suspected, where a crown is afterwards required, it is well to observe the finger-nails of your patient, as I find that both appendages agree to a considerable extent in quality and quantity of growth.

In furtherance of the argument, though perhaps you will not admit is a strong one, that these large cells are pushing up the whole dentine organ, it follows that the formed dentine will also travel in the direction to which the tooth crown is to occupy; such movement may give rise to the flattening of the ends of the enamel prisms, from which we can see Tomes's processes emerging. Should not such a movement have a tendency to consolidate the enamel, for this does not commence to form until the dentine has commenced to calcify, and at this time the forward movement on the part of the mesoblastic tissues may take place in its efforts to drive out the invading ameloblasts, cells specialized from the epithelium.

I have an idea that there are some phenomena occurring during the life history of an organism, which I can only, for the want of a better term, call *physiological* irritation, as opposed to that of a *pathological* character, which would be associated with some form or other of inflammation.

I will take the physiological aspect first, which is only a means to an end: if no primary inflexion of epithelium, then no tooth will be formed; the mesoblastic tissue must be irritated to form its dentine, and subsequently the tooth will erupt, and, without enlarging upon the subject, pass on to the pathological aspect.

If from some cause or other, say prolonged irritation of the submucous tissue of the tongue from the ragged and sharp edges of a tooth, specially in the bicuspid region, the mesoblastic tissues become so lowered in vitality that they are unable to prevent the inward growth of epithelium, in other words, the balance of power for growth has been lost to the submucous tissue, and the surface epithelium has taken advantage of its neighboring tissue's infirmity and proliferates in all directions, and we have one of the varieties of cancer.

Another example, but more particularly to illustrate the force produced by multiplying cells, is the method by which dead bone, after separation by ulceration of further loss of living bone, is

brought to the surface of the body, not unlike the mode by which a tooth whose enamel cap stands in a similar relation; and although enamel may not be present in sufficient quantity to be recognized, even microscopically, there must necessarily be the skin of the tooth, which we have chosen to call Nasmyth's membrane, which is now affirmed to be of epithelial origin.

Still one other example, and that is the enormous amount of bulging which occurs between the inner and outer walls of a mandible, when such is affected with myeloid sarcoma; this bulging is entirely due to an increase of growth of large cells not unlike the cells which I have called your attention to as causing the propulsion of a tooth from its osseous environment.

So, to sum up these respective cells, which may be similar owing to their power of rapid development and of propulsion,—i.e., the new formation cells of granulation tissue, myeloid cells, basal dentine papillary cells, and in fact most connective-tissue cells of an anabolic character.

In the earlier part of this paper I mentioned the comparative balance of power for growth of epiblastic and mesoblastic tissues and at this point it is convenient to remind you that when the various glands, whether mucous, sweat, mammary, etc., are formed, there is always a preliminary heaping up of epithelium before invasion of the mesoblastic tissue by the aforesaid takes place, and it seems as though it was necessary to occur, to enable the Malpighian layer to obtain sufficient force to make its raid upon the bordering territory, since the power for growth in this early embryonic state is in favor of the epiblastic layer, otherwise there would not be any formation of the numerous cavities and canals which we find associated with the head and face, which are produced by the early invagination of this tissue.

Another instance of the force of power for growth is the early aberration of the enamel organ, which causes great distention of the bony structure, and was known to early surgeons as a tumor of an epithelial multilocular cystic variety. It has occurred to me whether that peculiar form of head, sometimes associated with rickets, and known as hydrocephalus, is in any way similar to an epithelial odontome, and it is due to that want of harmony which should exist between tissues, as the bone seems scarcely able to keep the cerebro-nervous system within bounds, and the consequent pressure might lead to the increase of cerebro-spinal fluid, due to the breaking down of its cells.

Assuming that the tooth in process of formation has commenced

to move towards the surface of the body, whether it is a free surface or partially closed like the antrum and nasal cavity, or may be at the angle of mandible on the outside,—for it will erupt sooner or later, unless there is a stronger force to prevent it,—how is the direction determined, and how shall sufficient room be made for the passage of the crown in the case of a tooth of limited growth, or the continuous renewal of a persistently growing tooth? In each case the first eruption is probably carried on in a similar manner.

The tissues between the forming tooth crown and the oral surface consist chiefly of the enamel organ, the inner and outer walls of the tooth-sac, bone, and muco-periosteum.

Now, most teeth before eruption have one or more points upon them, probably to assist this much-discussed process, and it is frequently observed that the lower central incisors in *genus homo* occupy less time in their eruption than the other remaining teeth of the series; the question naturally occurs, Why should this be? Is it that sufficient room having been made by a method to be described later, that the transverse diameter of the biting surface is more out of proportion with the neck when compared with other teeth. The opportunities that a child has for applying gingival massage to the mandible by making it a lever of considerable power, induced by nerve-irritation, such irritation being only a means to an end, and to produce atrophy of these tissues between the almost completed crown and the surface of the oral cavity.

We have all observed in our experience that the cells forming the wall of the dental sac can either build up or pull down the structures they are destined to be associated with, as instanced in exostosis and absorption of roots of teeth.

While the enamel organ is in contact with the dental sac, after a certain amount has been calcified, absorption begins to take place in the neighborhood of the forming crown, and from my observation I have noticed that when absorption is going on the blood-vessels in the immediate vicinity are much more dilated than when a deposition of tissue is taking place elsewhere, and in the case for a passage being made for the erupting tooth, such dilated vessels anastomose with those supplying the stellate reticulum, which I believe to be due to this being a ready market for the lime salts in the enamel organ only just taken from the bone by those cells having taken on an absorption function.

Supposing, now, that the bone has been removed by these osteo- or cementoblastic cells, there is only the muco-periosteum to be removed; this is probably subjected to atrophy on account of the

pressure cutting off the nourishment from below, and the separation of those two epithelial layers of cells, now atrophied, open sufficiently wide to allow the tooth to escape, and the portion of free epithelial tissue with a little mesoblastic material from the extreme tips of the dental sac now form the little elevations or dental cushions seen in and around the teeth.

The atrophied neck of the enamel organ, termed the gubernaculum, has kept back the mesoblastic tissues, and if we examine young, dry mandibles it is easy to find a number of holes behind the temporary teeth; this band of tissue was supposed by the older anatomists to pull up the tooth when ready; it may serve as an aid to the process by keeping patent a small orifice for the evacuation of the tooth, and it has occurred to me whether the obliteration of this gubernaculum is the direct cause of that variety of odontoma we commonly describe as dentigerous cyst.

The supposed contraction of the tooth-sac has been brought to bear by some writers as a method of eruption; if this is so, it is difficult to account for the dilated sacs not infrequently found calcified in follicular odontomes. Where teeth of persistent growth occur, especially those whose position is maintained by their curved shape, the contraction of the dental sac would serve little purpose, as it is found that the older the animal grows, the greater the calibre of the still growing tooth, so that there is always some osseous tissue to be absorbed before they can be pushed outward; these are well illustrated by the incisors of the elephant and rodents, and canines of many others.

In my opinion the only way that the tooth-sac can assist the first passage out of any tooth is very much like the driving of a wedge, just as the fœtal head dilates the os uteri previous to its expulsion.—*Journal British Dental Association.*

Reports of Society Meetings.

AMERICAN DENTAL ASSOCIATION.

(Continued from page 45.)

August 6, 1897.—Fourth day.—Morning Session.

THE meeting was called to order by the President, Dr. Truman, at 10.15 o'clock.

The Secretary read the minutes of the previous session, which were duly approved.

Dr. Crouse.—I think the matter of how or whether the transactions of the two societies be published in one volume should be settled.

Dr. Cushing.—It seems to me that the proper thing is for each Association to close up its business for itself. There is no reason why the transactions of this meeting should be published in that way; it will make very little difference in the matter of expense, and it will be more simple for the Publication Committees of the two Associations to attend to it individually. But I have a suggestion to make with regard to the transactions of the joint Associations: it would be proper to have that published as an addenda to our transactions and to theirs,—what transpired with regard to the consolidation of the two bodies.

Dr. Crouse.—I move that the plan outlined by Dr. Cushing be the sense of this meeting.

Motion carried.

Dr. Peirce.—I would move that the present Auditing Committee be instructed to audit all accounts that have been handed in, and that the Treasurer be authorized to settle the accounts as audited.

Motion carried.

DISCUSSION OF DR. CROUSE'S PAPER.

Dr. Patterson.—Dr. Crouse says that the amalgams upon the market do not exhibit the same peculiarities upon different mixings. I just want to make the statement that it is my opinion, and I think it is the correct one, that those amalgams will exhibit the same tests if they have been uniformly treated, and that is

where the trouble lies. Dr. Crouse, so far as he is before the Association, does not commence on a basis by which his experiments are of any value, to my mind. So long as those mixings are made with different amounts of mercury and amalgam, they will forever be different. He must use the positive amount of amalgam and mercury, which is the proper amount to be used, before these experiments will be of any value. So long as we cannot reach that point, what is the use of taking different materials mixed by different people and testing them? It proves only what one man does, and is not of any scientific value. When Dr. Crouse says that Dr. Black was the first one to make these experiments with the micrometer and other instruments, he is certainly mistaken, because history teaches us that many years ago Thomas Fletcher, of Warrington, England, made most of these important experiments on the same lines. I am very much interested in amalgam, and very much interested in having some settled and definite way of treating the various makes of amalgams which shall produce a definite result. It is true that all the amalgams on the market require a definite amount of mercury, but let each one be treated on a basis. By a perfect amalgam I mean one that will make a mass which will be a perfect, harmonious filling; that each atom will be satisfied with mercury and no excess used, because when an excess is used the whole mass is jeopardized. I know that some of the amalgams are very carefully tested, and every portion of the ingot is absolutely tested. It may not be so with all, but I have found that the manufacturers of the different amalgams make them very uniform, and when they are uniform and treated scientifically from a basis the results will be uniform. I have told Dr. Crouse privately, and I say it now, that I will mix not only twelve blocks, but twelve times twelve blocks, and let him test them with his instruments, and I am sure the results will be the same. I would have done so, but the instruments with which I work are not here.

Dr. Taft.—There are so many phases of this subject that it is hard to know what to present in reference to the matter. These experiments are very interesting, and it is to be hoped that from these and like experiments something more will be derived than has yet been found by anybody. I have not gone very extensively into minute experimentation with this material, but there are facts that I know about it. One mistake is the variation in the behavior of all such alloys, especially those into which mercury enters, and even the alloys of other metals. As you mix two or more metals together their behavior is different. Many times we

choose the direction, and we look only in that direction. We may all have predilections which lead us to look in those certain directions, and we are more apt to find things than when we do not. I have found that the different amalgams will vary very much; but the same alloy mixed with mercury,—and pure, distilled mercury it ought to be,—manipulated as nearly as they can be manipulated, will give the same results. I have seen amalgam giving apparently good results when placed in the mouth, and have seen the same amalgam utterly fail. It may be said, however, that this failure is dependent upon the mode of manipulation or the various environments to which it is subjected in different mouths. Some mouths are clean and healthy, and others are not; some have good secretions in the mouth, others have not; and those things certainly affect the material. The mouth is a severe test for anything that is liable to undergo decomposition. The fluids of the mouth are exceedingly complicated in character. They are subjected to variation from one state to another, and on this account whatever is placed in the mouth is subjected to a very active influence, so far as decomposition is concerned. In some mouths a standard amalgam, for instance, may be placed, and serve the purpose for which it is employed. The same material in another mouth will show oxidation, and in others contraction. It is this variation in behavior that constitutes one of its great objections to me. If I could find one that is uniform I should be more inclined to favor it. The matter of manipulation is, of course, a point upon which a great deal hinges. That was illustrated in the use of oxyphosphate. Discussion has been had upon the conditions of oxyphosphates under the margin of the gum. In many cases I have seen it stand just as well under the margin of the gum as anywhere else, dependent, I presume, on the manner in which it was manipulated. I know just as well that in many other cases it fails in a very little while.

These are my objections: The liability to shrinkage, the liability to change of form, the liability to oxidation or decomposition. We find that the materials unite with other substances and blacken the mouth. There is another point with regard to solidification: take some varieties of amalgam and break it open, and you will find a good deal of crystallization has been effected. In other cases this crystallization will have almost entirely failed, and the mass in its solidification has assumed a granular form, which is very different from the form where perfect crystallization takes place. My attention was drawn to this when I experimented with crystal gold. I found the same gold, manipulated in the same way, would act

differently. Sometimes perfect crystals would form, sometimes small crystals, and sometimes large ones, and in other cases not any crystals at all, but a granular mass that had no more cohesion than particles of sand would have. In the crystallization, when perfectly made, there would be strong cohesion; in the other cases the mass would fall apart like so many beans in a pan. I think the environment at the time of the manipulation influenced the results. Sometimes the atmosphere affected it, and it was impossible to get a perfect crystallization. On a clear, cool day, good results would be obtained; and on a dark, lowering day it would be almost impossible to get crystallization. I think the electrical condition that may exist in the atmosphere at the time of the operation has a great deal to do with it. There are so many circumstances adverse to the results that we all desire that I have yet to use the first amalgam in the mouth. My experiments of forty years ago led me to this point, and I could not conscientiously use it. I might have saved a great many teeth with it, but had I used it there would have been a great many more failures than I have had with better materials. I advise against anything that I cannot conscientiously employ myself.

Dr. Custer.—The slight oxidation of an amalgam filling is the best thing that can happen to it, not to the degree of blackness, but a slight tarnish. That is the same as polarization which takes place in a cell, and galvanic action is stopped; so I believe oxidation is one of the best things that can happen to an amalgam filling.

Dr. Peirce.—It is a law of nature that similar things, being similarly acted upon, must bring a similar result. The question comes, when we arrive at a definite conclusion regarding the amount of alloy and the amount of mercury that is best adapted to make an amalgam, Shall we not in future have those placed in capsules, to be used together, so we get different mixtures? The amount of trituration varies also. Having an equal amount of alloy and mercury, you want a uniform amount of trituration to produce the same results. Then, too, we place it in different environments, which must also have an influence on its condition. In some mouths it hardens at once; that is due to environment. If we can come down to the facts in each case, and insure a uniform action in every particular, then we shall always have uniform results, but on account of the environment in the mouth we cannot do this. We can approach it by having the proper amount of alloy and mercury, and then we can approximate the proper

amount of trituration for the preparation of the plastic filling. As we approximate it we bring a better result, but it is uncertain, because we never can tell the conditions of the environment under which it crystallizes or hardens, and we cannot control that.

Dr. Crouse.—I think that some of Dr. Patterson's propositions are correct. As to the experiments of Fletcher, I remember reading them, but not as I should read them now; I shall take them up again and read them over. We want to settle on what combination of metals, when treated properly, will stay as you put them in any ordinary atmosphere, and be the strongest, and not shrink or expand. Then there is another question that the profession must settle. It is not possible to teach every dentist how to make his own amalgam,—how to manipulate it. It is not settled by those who have made the most accurate tests whether squeezing the surplus of mercury out of an alloy is better or not. The strongest blocks I have made thus far are amalgams that would mix and pack without squeezing out surplus mercury, and yet I have made some good ones by taking a towel or chamois and wringing it out dry. I think the alloy that will be the most useful will be one that is settled by definite experiment,—one which will be the strongest and flow the least, and have the mercury in one capsule and the amalgam in another, and then be mixed together. I have made too few tests of the blocks we had here. We put one in, and it would not stand a stress of fifty pounds, while another stood four hundred pounds. They were made of the same alloy. If there is that much variation in the manipulation, in addition to the variations in the alloys and the environment, is it any wonder that the careful observer has often become disgusted with amalgam fillings? Dr. Patterson says he has found the manufactured alloys run uniform. He has been more fortunate than I have been, or he has not made his accurate tests as I have, and I should question that statement on that account. You hardly ever find a make where two preparations under the same label run alike, where they put up one hundred ounces at one time and one hundred ounces at another time. I could name a combination which the burning out of one ingredient in one hundred will alter entirely. That does not come down to the test that will keep micro-organisms out from between the teeth. I believe that that will be the proper way to put alloy on the market with the mercury. It would be safe to say that from an alloy that would make the mass as plastic as could be handled well, and will hold as much mercury that you cannot squeeze out the surplus, you will get the best results.

Subject passed.

Dr. Ottofy.—I move that at the final adjournment all the permanent members present sign their names in a book, which we have here, and that H. A. Smith and Jonathan Taft, who were present at the opening of the organization, sign at the end.

Motion carried.

Dr. Crouse.—I move a vote of thanks to the proprietor of this hotel for the kindly treatment of the Association during our stay.

Motion carried.

Dr. Taft.—It was mentioned that but two of those present were at the organization of this body. A number of those who were present at that time have passed away; others still remain, but are not with us to-day, and when we look back to that occasion it produces a feeling of sadness that the career of a body that has accomplished so much as this one now terminates by the inevitable trend and run of progress and of circumstances in the profession. To those who have been long years with it, and especially to those who were at the organization of it, it produces a feeling of sadness that associations which we have had here together as members of this body will now cease forever in the capacity in which they existed heretofore. It is not unreasonable that these feelings should be indulged in; they cannot be avoided, by some of us at least. This Association accomplished a grand work for the profession, not only in this country, but wherever dentistry is known on this wide earth. It has ever striven for the betterment, the improvement, and the elevation of the profession, and when we compare the condition of the profession at the origin of this body with what we see now, we can fully realize that fact. The profession stands to-day in a vastly advanced position, and it is largely due (although not entirely) to the work that has been done in and by this Association. We all know what it has done for the stimulation of the work in State and local societies, and for the literature of our profession and our educational systems. It has fostered all these things, and they are due to the efforts of this Association. It is to be hoped that the memory of this body will not pass from any who have been in its ranks and co-operated in the work which it has so nobly done; that its career will be held sacred in the memory of all its members. It has steered well through the difficulties which it has encountered, and it has come out to a grand end, and that into which it has merged will go on and be as efficient, as honorable, and as well directed in all the future years as this body has been and done in the past. May we all realize this fact in years to come!

Dr. Corydon-Palmer.—I can but have a feeling of sadness when I remember the long years that we have passed through, and how this organization was first commenced. I was present at the time. As I have been a member and have gone along with it all those years, I feel sad at the thought that it will soon pass away.

Dr. McManus (of Hartford, Conn.).—Two years ago, in New England, two societies, one thirty-two years in existence and the other thirty-three years, came together and voted to form a joint society. One was the New England and the other the Connecticut Valley. I was a member of the Connecticut Valley from the first year. A few of us felt sad, as Dr. Taft and Dr. Palmer feel to-day, at the disbanding of the societies, but it was the vote of the majority that it was the best thing to do to form a new association, called the Northeastern Association. It was a movement in the direction of trying to strengthen the societies, and still have an organization where the different members could meet together and keep up their friendly relations, and to work up an interest in the State societies. Many of us did not think at that time that what has been accomplished here would be done. We believed that the American Dental Association would go on, and that the Southern Dental Association would also continue. In the movement that is taking place now, I have been gradually brought to see that it was the proper thing to do, and I do not feel as badly as I did when we changed our society up in New England. It is over thirty years since Dr. Taft came up there to awaken interest in that society, and many of us remember with pleasure his visit to Connecticut with Dr. Atkinson. Their presence on that occasion stimulated the dentists of the region. Our State organization had been in existence, but the presence of those two gentlemen gave renewed vigor to it. New England has always been very grateful for the visit of Dr. Taft at that time. This movement has been very successfully accomplished, and I have great reason to hope that the National Dental Association will do even greater work than the American Dental Association has done in the past; but if it only goes on in the same way, if it will do as much as the American Dental Association has done in the past, it will have glory enough.

The American Dental Association has been exceedingly kind to me. As far back as 1865 the members honored me with the vice-presidency, and some years later they again elected me vice-president. I felt I have had enough honor, but yesterday they again elected me vice-president, and I must thank all the members of the

American Dental Association. They did so because they had a kindly feeling for me, as I had been a member so long.

Dr. Taft.—The visit that was made throughout the East and other parts of the country, as referred to by Dr. McManus, was the work of this body. It was not Dr. Atkinson's work nor mine: we were sent forth by this body to do certain work. The committee did as well as it could, and if any good was accomplished it is a matter of great gratification to me. I wish to say that I disclaim any credit for that work at all; the credit of it belongs to this body. It originated when this body took a fostering care of association work all over the country.

Dr. H. A. Smith.—I have been a society man from the beginning. On the day I received my degree I joined the old Mississippi Valley Association, and was a member until its dissolution. I often said if my relations with dental associations had been cut out of my dental life it would have been comparatively a blank, nothing but drudgery and hard work; but it has been the meeting with my fellows that has stimulated me. I came into this society as a young man, and have been in close attendance ever since. To me it has been almost invaluable. The members of the dental profession are the best fellows alive. They are cultured to the highest degree, they are sociable, and I never enjoy myself so much as when I am with them. Then the professional side of it. Think of meeting men who have reached the highest attainments in dentistry and given their best experience! From that stand-point it has been of immense value to me. I feel many regrets that it goes out of existence, yet I think it will go on in the new body, and we will go to new efforts in every way.

Dr. Crouse.—I remember very well my first meeting in the American Dental Association. I was about seventeen years old, and thought I was a dentist. I attended a course of lectures and went into partnership with a man I studied with. A call came to that office, signed by Dr. Cushing and some other gentlemen, to form a State society. The American Dental Association met that year in Chicago. There were some entertainments to be given, and the delegates were asked to come up and give their tickets, and I went up with the rest. I remember seeing Dr. Taft, Dr. Atkinson, and some one else whose name I have never been able to get. I remember just how he looked, and I remember he built out the corner of a front tooth, which was a marvel to me at that time. I went home and told my brother I was not fit to fill teeth according to the way they filled teeth there. Sometimes a young

man needs encouragement, and my brother gave me that. At the Centennial in Philadelphia, somebody put me on the Executive Committee, and I have been on ever since, except one year when I resigned. If you want to enjoy a society, get in and work. The fellows who do not do anything do not get the good of it. It is the men who work and do something. I would be a miserable being if I did not have something to do. That would be the plea that I would make,—have all the members do something for the society. To me, what this society has done cannot be estimated or spoken of in words. To this and my State society I owe everything that I have made of myself.

Dr. Peirce.—I want to say a word to bring to memory a friend and brother from Philadelphia, Dr. J. H. McQuillan, who probably was as instrumental as any one man in forming this Association. I remember several conversations with him, and the deep interest he took in it. I remember he was at Washington and at the subsequent meeting at Niagara Falls. I was secretary at the convention that year, and was not at the organization. To Dr. McQuillan in its organization, to Dr. M. S. Dean in the carrying on and working out of the society, we owe much. He brought me into it, and everything I gained the first few years I gained from him. He was not a fluent talker, nor did he often take the floor; but he was a good worker. He influenced me more than any other man except Dr. McQuillan. The influence of the organization on the dental profession we cannot estimate. It has been unlimited in the education and stimulation of young men. I can remember the first paper I ever brought before the Association, and the kindness with which it was received and the stimulation it was to me to do other work. What has been the influence on myself, I think was the influence on many others,—to do original work and formulate their ideas, and bring them to an association where they were fully appreciated. In that way we cannot over-estimate the influence this organization has exerted on the dental profession in this country.

Dr. Fillebrown.—I feel as much interest in this society as any one who was not an original member, and not a constant attendant until recently. I feel with Dr. Crouse that my greatest happiness has been since I became a worker in it. To be a worker is the only way to enjoy a society. You know a grain never produces the fruit until the seed dies. Progress is built on the ruins of the past; so all through history we find that a race has done its work and faded away, because their work was done. The world goes on, and

new circumstances come that make it impossible for the former association to do the work demanded of it. The American Dental Association has arrived at the point that many other associations have in the past. There was a work to be done, which under the circumstances the American Dental Association, as such, could not do. The only way for it to be done was for a new organization to be formed. Happily that has been consummated. Our good friend Dr. Smith says the spirit of the Association passes into the new organization. I would improve upon that by saying not only the spirit, but the spirits. Each individual spirit goes into that new association to give life to it, and join with it the wandering spirits that have been floating around unorganized and not in harmony with it. There is the happy feature that by the giving up of this organization the same ambitions, enthusiasm, and scientific attainments join hands all over the country, and come together in one strong union that shall carry it on to greater perfection. May the new association long live, and always look back to the American Dental Association as the basis which has made it possible that it should exist.

Dr. Taft.—I trust it will come into somebody's mind to prepare a condensed history of this society, and publish it, embracing those who have been the leading actors in its work, especially those who have passed away, and embracing the principal acts and the leading work which this society has done. Of course, this history can be gathered up from its publications; but it would be well to have it in a few pages.

Dr. Patterson.—Some fifteen years ago, when I came as a delegate from the Kansas association to the meeting at Niagara, what impressed me then, and has since impressed me, was the cordiality with which I was received. The gentleman who took my fee said, "Ah! all the way from Kansas; glad to see you." Dr. Taft and Dr. Kingsley, Dr. Barrett and Dr. Rehwinkel I also remember. I had lived thirty years and had never seen the ocean. I always remember the first meeting I attended, along with that fact. Since that time, the kindness I received has been more than I deserve, and I have tried in my weak way to make some return for the extreme kindness which I did not expect and for which I was not fitted. The memory of the American Dental Association, it seems to me, is safe in the hearts of its members, and the work it has done will not be forgotten.

Dr. Cushing.—I cannot let this occasion go by without saying a word. For nearly twenty years, through the partiality of the

Association, I have sat at the secretary's desk, and I have seen the members as perhaps nobody else has seen them, constantly before me as they come and go. I recall the old friends who have gone from us, and miss them every year as I take my place here. I have missed them constantly, and shall continue to miss them. I am not in a mood to make a speech, even if I were able to do so. It seems to me we are very much in the position that we would be if we were standing at the death-bed of a dear friend, whom we feel confident has gone to a higher life.

Dr. Taft.—I move that the thanks of this Association be tendered to the officers of the Association, and especially to our worthy secretary, Dr. Cushing, who has served this body so long and so faithfully, and to whom great credit is due for the work he has accomplished in this direction.

Unanimously carried.

The secretary then read the closing minutes, which were approved.

Dr. Truman.—Members of the American Dental Association. Since Dr. Allport, a warm personal friend of mine, began as president of this Association, up to this period, when I am called upon to close it, I cannot conceive that I have gone through any more trying occasion than this. When I left my home to come to this meeting, it was with a joyous feeling that we would unite with our Southern brethren, and form a new organization, and that has been accomplished. I only regret that in that organization those who had it in charge failed to read the signs of the future. I do not propose to criticise the proceedings here. I say it is with profound regret that they could not see their way clear to making some arrangement by which scientific work could receive financial support and should be made to live independent of daily bread. I regret that they did not see their way clear to eliminate, to my mind, the worst feature in associated efforts,—permanent membership; but I look forward hopefully to the time when that will be accomplished. I have one more regret,—that this American Dental Association should be left to die as it is dying to-day. To my mind it should have lived, and there was no reason why it should not have continued. It could have been made a branch. You have now before you the necessity of forming a new organization in the Eastern part of this continent.

We bring our wreaths and lay them over our dead. We gather at the tombs of our loved ones and take pleasure in recalling their virtues and the work they have performed. It is well that we

have met here to-day, not only to mourn the loss of this Association, but to recall to memory the work it has performed for dentistry in this country and the world. As we pass away from this hall, sadly remembering that we shall no more meet together under its banner, may we return to our homes feeling that the future will take care of itself; that the profession of dentistry is worthy of our best efforts, and that we will, as long as we may live, support any organization that may be established, hopefully looking forward to greater improvement.

In closing, it is, perhaps, unnecessary for me to say to you, members of the American Dental Association, that no more painful duty has been given me to perform than this of closing the sessions of this body. I have been an associate in its labors for many years, and have felt that it has stimulated me as it has others, and now the last word must be said, and in my official capacity I declare from this platform that the American Dental Association has completed its work and is disbanded forever.

NATIONAL DENTAL ASSOCIATION.

(Continued from page 48.)

August 6, 1897.

THE meeting was called to order by President Fillebrown, at one o'clock, in the ball-room of the Hotel Chamberlain.

Dr. Walker read the minutes of the previous session, up to the time of consolidation and election of officers, after which Dr. Cushing continued the reading of the minutes. The same were duly approved.

The Secretary then read the organization of committees as follows:

Executive Committee.—J. N. Crouse, chairman; M. F. Finlay.

Committee on Arrangements.—Drs. Crouse, Noel, and Smith.

Auditing Committee.—Drs. Jackson, Patterson, and Finlay.

Committee on Voluntary Essays.—Drs. Peirce, Dickinson, and Eubank.

Committee on Publication.—Drs. Harlan, Turner, and Cushing.

Committee on National Museum and Library.—Drs. Donnelly, Morgan, and Fillebrown.

Committee on Terminology.—Drs. Guilford, Molyneaux, and Foster.

Committee on Journal.—Drs. Marshall, Taft, and Noel.

Committee on History.—Drs. McManus, R. F. Hunt, and Gordon White.

OFFICERS OF THE VARIOUS SECTIONS.

SECTION I.—Grant Molyneaux, chairman ; R. R. Freeman, secretary.

SECTION II.—Dr. Catching, chairman ; Dr. Finlay, secretary.

SECTION III.—Dr. Crawford, chairman ; Dr. Holland, secretary.

SECTION IV.—Dr. J. I. Hart, chairman ; Dr. Hinman, secretary.

SECTION V.—Dr. J. S. Cassidy, chairman ; Dr. L. P. Bethel, secretary.

SECTION VI.—J. D. Patterson, chairman ; L. E. Custer, secretary.

SECTION VII.—W. C. Barrett, chairman ; George B. Clement, secretary.

Hygiene and Prophylactic Dentistry.—Dr. Noel, chairman ; Dr. Thompson, secretary.

Orthodontia.—Dr. Jackson, chairman ; Dr. Dotterer, secretary.

Clinics.—Dr. McKellops, chairman ; Dr. E. P. Beadles, secretary.

Dr. Crouse presented the following, which was moved as a standing resolution :

Resolved, That any member of the dental profession who has been in reputable practice for a period of fifty years may be elected to permanent membership in this Association without the payment of dues, and any member of this Association who has been in practice for a like period shall have his dues remitted thereafter, by presenting the fact to the Association.

Carried.

Dr. Finlay offered the following resolution :

Resolved, That the Committee on National Dental Library and Museum be authorized to seek, in the interest of public health, the employment at government expense of at least one dentist of eminent fitness in the Army Medical Library and Museum at Washington, whose time when so employed shall be devoted to the advancement of dental science.

Motion carried.

Dr. Taft offered the following resolution :

Resolved, That a committee of three shall be appointed, whose duty it shall be to confer with State and local societies, and aid and foster new societies when and where desirable.

Carried.

Dr. Cushing.—It was suggested, as to the publication of the transactions, that it would be a good thing for both societies to print as a supplement to their transactions the transactions of this National Dental Association, provided this Association will consent to that.

Dr. Crawford.—I move that the National Dental Association request the officers of the American Dental Association and the officers of the Southern Dental Association to incorporate in their published reports all of the proceedings of the National Dental Association since its organization yesterday.

Carried.

Dr. Taft.—In reference to the resolution I just offered, I would say that such a committee can be eminently serviceable to the profession, to local societies especially, being known as the connecting link between this society and all other societies in the country. We hope that this committee will make a report at the next annual meeting.

Dr. Crouse.—I move that a committee be appointed from this Association, consisting of one member from each State and Territory, to work in the interests of the Dental Protective Association, and to see that the delegates are members of the Dental Protective Association.

Motion carried.

(The appointment of such committee will appear in the printed transactions.)

NEW BUSINESS.

Dr. Richards.—In consideration of the fact that the American Dental Association and the Southern Dental Association have passed into history, I move that the gavels of the two Associations be properly engraved and stored away in the archives at Washington, together with the other effects that we have voted to go there.

Motion carried.

Dr. Crawford.—I want to ask unanimous consent to do one more thing before we adjourn, and the reason I ask it is because I know it is right, and will result in the most good to the dental profession in the United States. When there is any one definite thing to be done of public interest to everybody there is usually a very easy way to find out how it ought to be done. The American Dental Association has acted gracefully, and the Southern Dental Association has acted gracefully and nobly. The members of these two historic organizations have come together in the proper fraternal spirit, and we have to-day completed the greatest organization of

dental surgeons that is now in the world. If we do our duty, future history will have it that it is the greatest organization that this century has any cognizance of; but if we act timidly when a responsibility is placed upon us, the future will not be so glorious. The old American Dental Association has folded its banner, and, like the Arab, is preparing to "silently steal away," and the Southern Dental Association will have a meeting in Florida one year from now and maintain its identity and its name. In view of all this, I rise for the good of the profession to ask unanimous consent that in deference to the previous history of American dentistry, and the devotion of every man to the Union and the constitution, the name of this Association be "The American Association of Dental Surgeons."

The President.—The chair feels obliged to rule that he cannot entertain that motion for unanimous consent. Had that appeared in the convention before they were acting under its constitution, it would have been perfectly permissible, and the name could have been changed. The Association organized, took its constitution for a guide, elected its officers, adjourned, and now meets in a second session. It seems to me that it would be incompetent to entertain that motion and change the name.

Dr. Moore.—Is it not competent for this body to reconsider any action that it has taken at the first meeting?

The President.—I should think not, because so many are absent from this meeting who were present at the last.

Dr. Stellwagen.—I feel that I am among intimate friends and men who have known me for years. Some differ with me, but I sincerely believe, if they will think the subject over thoroughly, that there is a way out of all trouble in regard to the name. We have had three great epochs in this nineteenth century in dentistry. We have embraced a study of the mouth entirely, and not confined ourselves to teeth. We have now united two great societies, and as a result of the union of these two societies the time seems to be propitious for the adoption of the name which is truly explanative of what we are,—stomatologists. We no longer confine ourselves simply to the teeth, and send our patients who require attention with regard to the soft tissues of the mouth or jaws to other men. We have taken up the study of the entire mouth, and the work of these two societies has been stomatological, and not merely dental. It is a narrow term which does not encompass the entire work. I move as an amendment, that we may act upon it coolly and deliberately at our next annual meeting, that the word "stomatological"

be inserted in the place of the word "dental." That would make it the "American Stomatological Association." We are yet in swaddling clothes, but it is the swaddling clothes of a broader and more complete education and profession, with no disrespect to dentistry. It is time we have grown out of the old rut.

Dr. Peirce.—I hope the suggestion just made will not be considered, and we shall not make ourselves the subject of ridicule by all scientific men. "Stoma" means an opening, not the oral cavity at all. It has no more relation to the mouth than to any other cavity or opening in the body.

Dr. Hunt.—We cannot make any change at this session of the National Dental Association without the unanimous consent of all members. I give notice that I will oppose at this session any change in the name. I do so for the best interests of the Association, and I want to prevent any hasty action. We have this National Dental Association; we came here to form it, and now do not let us change it.

Dr. Crawford.—I move that the secretary be requested to read the resolution that was presented in conformity with the constitution and by-laws, and that we now proceed to properly name this organization.

The President.—The chair has knowledge that there will be objections raised and persisted in.

Dr. Guilford.—I would like to offer an amendment. Dr. Crawford proposed the name of "The American Association of Dental Surgeons;" Dr. Stellwagen proposed the name of "American Stomatological Association." I would suggest the name of the "American Academy of Dental Science." An eminent professor, in conferring a degree, said, instead of "Doctor of Dental Surgery," "Doctor of Dental Science," and when his attention was called to it, he contended that he had not made any mistake, and that he had stated it correctly.

Adjournment.

THE NEW YORK INSTITUTE OF STOMATOLOGY.

A REGULAR meeting of the Institute was held Friday evening, November 5, 1897, at the office of Dr. George S. Allan, No. 51 West Thirty-seventh Street, the President, Dr. George S. Allan, in the chair.

The minutes of the previous meeting were read and approved.

COMMUNICATIONS ON THEORY AND PRACTICE.

Dr. S. F. Howland.—I would like to know what has been the experience of those present as to the length of time a retaining appliance should be worn to keep teeth in proper position after regulation. In the case I have in mind, the superior incisors were moved backward, the centrals being moved nearly a half-inch. I once had a similar case where the retaining plate was worn a year, and proved insufficient, as the teeth moved slightly after its removal. In the case I now mention the teeth have been kept in place one year, and I propose keeping the retaining plate in at least six months longer.

Dr. J. F. P. Hodson.—I do not think there is anything in the way of regulating teeth that is so unsatisfactory as moving back upper central incisors, or, rather, keeping them in position thereafter by any ordinary method of limited rotation. I have, therefore, invariably made cavities in the posterior portions of the teeth, and put a little band of gold inside the front teeth, attached to tiny studs set into the cavities, to stay there for an almost indefinite period. I do not think that the tendency of the upper front teeth to move forward again can be overcome in any single year or two. I keep them back for a series of years with a positive appliance.

The President.—May I ask Dr. Hodson to explain more fully his method.

Dr. Hodson.—I would deliberately make cavities in the posterior surface—there are natural depressions there already—for the purpose of forming sufficient holding points for the tiny studs attached to the half-round wire. This wire would extend along the gum inside and be attached to some tooth on each side of the mouth back of the teeth to be retained. The little studs, being cemented into the cavities, would hold the teeth positively, and the gold, not showing in front, would be worn without protest for a long enough period to make me sure that the teeth would not move from their new positions.

Dr. C. A. Woodward.—I have heard reports of disagreeable results in taking X-ray photographs, one of which may be of interest. A lady came from the West to have me diagnose her case, and if possible relieve her. She had had trouble in the region of the antrum for nearly fifteen years. On her arrival in the city, finding that I was out of town, she went to a surgeon for advice. He examined her mouth, and found that all of the molars and bicuspids had been removed on that side from time to time, as it

was thought that they might have been the cause of the trouble. He could see nothing that was abnormal, but, thinking it possible that there might be an undeveloped tooth, advised her to have an X-ray photograph taken. He sent her to one of the most skilful men in the city, and while having the photograph taken she experienced no particular discomfort or pain. The time consumed in taking the photograph was about ten minutes.

On the morning of the second or third day after the photograph had been taken, while she was arranging her hair, all the hair on that side of her head came out. The next morning she found her face was deeply wrinkled, the flesh drawn and very red. She became alarmed, and consulted one of the best-known physicians in town, telling him what had been done. He advised her not to leave town at once, as she desired to do, but said that it was absolutely necessary that she should return to her hotel and shut herself up in her room for at least twelve days for if she did not he would not be responsible for the result. I will say that he feared that the inflammation might go to the ear, and also to her eye. At the end of twelve or fifteen days she was obliged to leave the city. Before going, she thought she would call upon the gentleman who took the photograph, to see what explanation he could make. He said he was very sorry, and presumed that he had held the lamp too close to her face.

Dr. S. F. Wilcox.—I happen to know something of the bad results of the X-rays, because I have seen such results in two of my cases. When the X-ray was first discovered, it was supposed to be entirely harmless, and so it was used considerably, especially for finding bullets, and at the Flower Hospital there were some severe burns resulting from its use. I happened to hear of a very persistent case of otitis, which had been under the care of the best surgeons in Philadelphia. The man had some trouble with his thumb, and, in order to determine what it was, one of the surgeons asked him to go to the laboratory and have it photographed. They could find nothing which showed particularly, but the result of the application of the rays to the bone was that it immediately got well. So, having two cases of otitis of the tibia, I thought I would try the X-rays on them. The rays were applied by a skilful electrician, and the relief from pain in the bone was something remarkable. In one case the patient had complete relief for quite a long time, but the pain afterwards returned. In the other case the relief was not quite so marked. In the first case the patient had an attack of paralysis on one side, and was confined to his bed,

and while in bed the pain returned and was exceedingly severe, so it was thought best to try the X-rays again. The doctor had a static battery set up in the patient's room, and the lamp was not placed directly over the leg, but a short distance from it; there was not, however, so much relief this time as on the former occasion. The pain and tension became so great that I cut down through the tibia into the medullary canal, and this relieved the bone pain at once. At the time of the operation there was only a dark discoloration of the skin. Shortly afterwards, while the healing process was going on in the bone, the skin began to come off at the dark spot, which was about as large as my hand, and the part was entirely denuded of skin, leaving an irritable, indolent ulcer, which up to this time has utterly refused to heal.

The X-rays not only destroy the skin, but seem to prevent all power of repair. They also seem to destroy all vitality in the subcutaneous tissue,—not exactly kill it, but destroy all power of reproduction of new cells. In this case the patient's general condition was low, but still, even with improved health, there is no improvement in the local condition. It is claimed that this is due to the fact that ozone is generated and has an irritating effect on the tissues when the lamp is held close.

Somebody, a short time ago, said that he had invented some sort of an arrangement which would prevent the destructive action of the X-rays, but it is impossible to get it from any one but himself, and, as his price is so high, it is hardly known whether it is a "fake" or not.

The President.—Do X-rays produce local paralysis?

Dr. Wilcox.—No, they do not produce paralysis, but a destruction of tissue and an apparent inhibition of all proliferative power in the tissues.

The President.—Does it affect the nerves?

Dr. Wilcox.—No, I do not think so. It is claimed by some electricians that the trouble is not produced by the use of the static machine; but that is a mistake, because in the cases I spoke of the trouble was all produced by that.

The paper of the evening, entitled "The Philosophy of Exudative Inflammation," was then read by its author, John Rogers, M.D., who also showed charts prepared by Dr. Ewing, illustrating the paper.

(For Dr. Rogers's paper, see page 65.)

DISCUSSION.

The President.—Desiring to bring this subject before the society in all its latest developments, I asked Dr. Rogers if he would prepare this paper, so that we could have the story of inflammation, and the processes attending it, fairly before us. When I first spoke to Dr. Rogers, I hoped to have the paper divided into two portions,—the first being the theory of inflammation, and the second, the clinical aspects of it. But I found that the subject was by far too large to be condensed into the time that could be devoted to it.

As to the thoroughness with which Dr. Rogers has completed his task, I think you are all ready to say that he has covered the ground, and I now take pleasure in asking you to discuss the matter fully.

Dr. Wilcox.—From the beginning to the end of the excellent and comprehensive way in which Dr. Rogers has treated the subject, there is nothing left to discuss. The whole ground has been covered. I cannot see a single point to bring up any further than the doctor has done.

Most of our theory of inflammation has been based upon the discoveries of Cohnheim. He, of course, made his experiments and published them before the present methods of aseptic surgery were known. It has always seemed to me that the way in which he made his experiments must have been accompanied by more or less infection. I would like to ask Dr. Rogers the method in which the aseptic reparative process is now demonstrated. I mean, can there be any possibility of infection in any way, by the atmosphere or anything else?

Dr. John Rogers.—The aseptic repair, I believe, is demonstrated by making several wounds in the same rabbit, or several rabbits, and keeping them carefully clean and aseptic, then killing the rabbits at different stages, and making sections of the results. There is always possibility of infection of the wound, but a wound can be made aseptically and kept aseptic.

Dr. James Ewing.—I do not know that I can add very much to Dr. Rogers's explanation of the charts. I may say that one is intended to illustrate what was originally known as the "Phenomenon of Pfeiffer,"—that when certain bacteria are injected into the peritoneal cavity of immune animals, the bacteria are destroyed with most remarkable rapidity.

In examining the phagocytic cells in this experiment, at early periods after the injection into the immune animal, the bacteria

were first found ingested by the different forms of leucocytes, and in examining these leucocytes very shortly after the disappearance of the bacteria from the peritoneal cavity, Pfeiffer found them in all stages of granular disintegration. He followed this degeneration still further, and found that the ordinary staining reaction was lost very shortly after the bacteria were absorbed into the leucocytes, that they stained with red acid dyes instead of the blue basic dyes, and finally began to lose staining capacity entirely.

You are all familiar with the recent application of the serum of immunized animals in cases of diphtheria. It is the first practical application of the bactericidal properties of body fluids observed in the "Phenomenon of Pfeiffer," in general medicine. In Widal's test in typhoid fever, also, we see the action of a serum of an immune patient upon the actively motile bacilli, in collecting them first, causing loss of motility, and finally breaking them up into small granules.

As to the other charts, I have nothing to say. They have been fully elucidated.

The views which are given by Dr. Rogers are those generally accepted, though not entirely so, by the English school, but not by the German.

The classification of leucocytes, also, has not been thoroughly worked out, nor can it be said that all the functions of the different leucocytes are so closely identified with the different parts of the process of immunity as some Englishmen would have us believe. The simple observation that soon after the injection the bacteria are found within the leucocytes would not be accepted by the average pathologist as positive proof that this process results entirely from the action of the leucocytes.

I have been struck by the improvement and the advance made in the study of inflammation in the last ten years. Fifteen years ago we would have had to be content almost entirely with the mechanical side of the question. We could show how blood-vessels were injured and serum was exuded, and could follow the fate of these exuded products into the repair or necrosis of the tissues, and there we would have to stop. But thanks to the study of many eminent pathologists, we have an entirely different side of the subject as shown in Dr. Rogers's paper, and there is no question but that that is the essential part of the process. In these charts I have endeavored to show some of the evidences that the chemical process is at the base of most previously considered mechanical processes of inflammation.

Dr. J. Morgan Howe.—If I understood correctly, Dr. Rogers said, in his paper, that phagocytosis is rather a secondary germicidal property, and that the germicidal properties of the blood-serum are rather more important.

Dr. Rogers.—I think that is the general consensus of opinion of most pathologists, that phagocytosis is secondary.

Metschnikoff, who was practically the originator of the theory of phagocytosis, believed that everything was dependent upon it; but there are too many experiments to show that the bacteria are dead before phagocytosis has occurred, to make that entirely tenable. Nevertheless, it is probable that the bactericidal substances are ferments, and as such are derived from the cells. The one process can hardly be said to be more important than the other, inasmuch as the extra- and intracellular micro-organisms are affected by the same substances. Those outside the cells are injured by the secretion, so to speak, which digests and so destroys those which have been devoured.

Dr. Ewing.—I would like to say that, although every one is aware that phagocytosis is a secondary process in inflammation, the services of Metschnikoff were not so much in calling attention to the process of phagocytosis, as in demonstrating the importance of the leucocytes in inflammation. The fact that the ingestion of the bacteria may be preceded by other changes does not detract from the value of his observations. He has shown that the leucocytes are essential in the process of immunity, and the only addition to his work is that the immunizing substances are produced by the leucocytes, and in some instances it is necessary for them to make use of these immunizing substances, which destroy the virulence of bacteria before phagocytosis occurs, the leucocytes, nevertheless, being the chief agent in the process.

Adjourned.

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Editor The New York Institute of Stomatology.

ACADEMY OF STOMATOLOGY.

A REGULAR meeting of the Academy of Stomatology of Philadelphia was held November 23, 1897, Dr. Edwin T. Darby in the chair.

A paper on "Arsenical Necrosis" was read by Dr. Otto E. Inglis. (For Dr. Inglis's paper, see page 76.)

DISCUSSION.

Dr. S. H. Guilford.—The subject which has been chosen by the essayist is an interesting one. We have all of us had more or less experience with the escape of arsenic upon the gum, though such an accident is not likely to occur where reasonable care has been observed. The fault in such cases may lie in the contributory negligence of the patient. I recollect one case in my early practice where I applied arsenic to two bicuspid in the superior jaw of a young lady, giving instructions to her to carefully maintain in position the coverings of cotton and sandarach varnish which it was then the custom to use. She was to return in a day or two, but I did not see her for a month. Upon examination I found considerable necrosis, and a portion of the septum had to be removed. Our greatest safeguard undoubtedly lies in the careful sealing of the application in the cavity, though I fail to see why zinc phosphate is not as generally applicable for this purpose as facing amalgam.

Dr. James Truman.—I was pleased with the essay, and especially that portion of it which dealt with the theory of the action of arsenic upon the tissues. There has been but comparatively little attention paid to the phase of the subject selected by the essayist, and any one who has been in a position to observe knows the carelessness with which frequently students handle this drug. I cannot agree with the essayist in regard to the use of ferric hydrate. In those cases of necrosis in which I have been consulted by students I have generally been able to control the action of the arsenic with dialyzed iron, which is equally a chemical antidote for arsenic and is a more available drug.

If left to itself arsenic acts upon the gum-tissue, penetrating more and more deeply until it becomes inert; then that portion which has been chemically destroyed is thrown off. It is true that even with the use of dialyzed iron some tissue will be sequestered, but I believe it to be only that which is destroyed before the case is taken in hand, and that the action would have been greater had not the antidote been used.

Dr. H. C. Register.—The essayist has certainly brought out some nice points in regard to the action of arsenic. A very few cases have occurred in my practice, and in each instance the action upon the gum tissues has been slight and seemingly controlled by the application of the ordinary antidotes. In applications to the pulp, I have found the action always happier when the hyperæmia of the

pulp is first relieved by depletion. Carbolic acid has not seemed to act so well as a menstruum as other and milder medicaments, such as the oil of cinnamon.

According to the experiments of E. Riegal, arsenic does not act upon mucous membranes unless the cuticle is in some way broken or injured. When this has occurred, however, the action is only limited by the power which the given quantity of arsenic has of combining with the tissue. It may be that the use of carbolic acid as a menstruum may effect that injury which is necessary for the action of the arsenic upon the gums.

I have great faith in the ferric hydrate as an antidote, but it should be used in quantity sufficient; it being calculated that twelve times the amount of the arsenic is the quantity necessary to effect neutralization.

Dr. G. C. Chance.—A personal experience has led me to believe that there is a great evil practised by druggists in dispensing a preparation of arsenic for relief of toothache. One evening, when suffering from pulpitis, I asked of a nearby druggist a preparation of oil of cloves and morphine acetate. He assured me that he had a preparation containing only those ingredients. Reluctantly I accepted his cure, with the result of increased pain. Upon examination next day by a professional friend necrosis of the gum septum was found. Inquiry elicited the fact that incorporated with the mixture was also a percentage of arsenic. As not only this particular druggist, but several others of whom I have inquired, have wonderful faith in this preparation, I think that we should caution their profession against the evil results likely to come to the patient from the use of arsenic in so careless a manner.

Dr. H. B. Hickman.—In November, 1896, a lady came to my office with the inferior left first bicuspid abscessed with fistula of several years' persistence. After removing an amalgam filling and extirpating a dead pulp, I treated in the usual manner with carbolic acid, creosote, etc., but could not close the fistula for more than a few days at a time. After exhausting the list of medicinal agents I filled the pulp canal with aristo-paraffin, forcing it through the fistula until it appeared upon the gum. On the point of the wax I found a small particle of amalgam, and thought I had discovered the cause of the trouble. An unusual amount of aristo-paraffin was required.

As the fistula continued to recur, I dissected the gum back and with a large bur cut out all the necrosed bone lining a pus-cavity of considerable size, into which my paraffin root filling had probably

been forced in the first instance. I then smoothed the root. After flooding the bone-cavity with a disinfectant, I dried it as well as possible, filled the root with aristo-paraffin, and drew the lips of the wound together with a stitch. Up to the present time the fistula has not returned. The second bicuspid was lost ten years ago as the result of an arsenical application carelessly secured. Is it possible that the necrosis over the first bicuspid root could have been the result of arsenical action?

Dr. M. J. Schomberg.—There is considerable room for scientific thought relative to manifestations of the local action of arsenic on living tissues. In explanation of the manner in which these manifestations, namely, ulceration, death, and necrosis, are brought about, a few facts should, to my mind, be taken into consideration. In the first place, we are all familiar with the preservative property of arsenic, it being used in the preparation of cadavers for preservation. Then again we know of its marked power of penetration. In a few cases where arsenic was taken with suicidal intent into the alimentary canal, post-mortem examination revealed by the test for arsenic that it was present in the brain. Now, granting that the chemical properties of dead tissue which has not undergone putrefaction is precisely the same as living tissue with the exception of vital force, and noting that in the former it preserves and in the latter it destroys, we must come to the same conclusion as the essayist,—viz., the cause of necrosis of the tissue is the stasis within the blood-vessels. Again, this explains why the necrosis is localized, congestion preventing the absorption and distribution of this irritant poison. However, when portions of sequestra are thrown off the arsenic resident in the mass may attack adjacent parts.

The President.—We will ask Dr. Inglis to kindly close the discussion.

Dr. Inglis.—The first speaker mentioned the relative merits of amalgam and zinc phosphate as coverings for arsenical applications. My own experience with zinc phosphate is that in proportion to the difficulty of placing the covering is it an unmanageable material. If used in a very soft condition it adheres readily to everything except the desired parts, and if mixed stiff it requires an undue amount of pressure. Where the rubber dam can be used, and in situations in which it can be flowed over the application, it is admirable. I was glad Dr. Truman mentioned the carelessness of students in this matter of arsenical applications. I recall one case in which I was consulted by a young graduate who had ap-

plied to the exposure in a buccal cavity of a lower molar a quantity of the S. S. White paste equal to twice the size of an ordinary pin-head. This he covered by squeezing temporary stopping directly down upon the application. This was gross carelessness and ignorance, yet this gentleman was a good operator from the manipulative point of view.

It is very difficult to estimate the value of dialyzed iron in cases of arsenical necrosis, inasmuch as the quantity of arsenic escaped varies so greatly, also the time elapsing between the inception of the trouble and the presentation of the patient is a factor which renders it doubtful if dialyzed iron is of more value than mere mechanical removal of the arsenic. There seems to be no case in which the arsenic is not self-limited in action. These two factors—quantity and persistence of application—seem to control the extent of the necrosis.

Editorial.

IS MORALITY A PRODUCT OF LAW?

THIS query came forcibly to the mind of the writer when the editorial in the *Dental Cosmos* for January was read. It assumes to be an answer to an "open letter" from the pen of Dr. B. F. Arrington in relation to examining boards, and, in addition, our esteemed contemporary paid special attention to an editorial in the same number of that journal.

It is unnecessary for the writer to take up the defence of the subject-matter in the open letter, for the writer thereof is fully capable of defending his own positions if deemed necessary. The question seems to have a broader outlook than a mere controversy in regard to boards of examiners, and resolves itself, naturally, into the more serious phase of law in its relations to morals, and directly as a powerful means for advancing civilization, if what is claimed for it be true.

It is trite to say that law is an outgrowth of an effort of society to protect itself. The older the civilization the more thoroughly has social life entrenched itself with statutes. This is so true of the countries of Europe that, whether the government be monarchical or republican, custom demands the same regulations, the

same everlasting surveillance of the police, the same complexity in legal forms until the freedom of the individual, whether under king or president, is practically annihilated.

From the dawn of civilization the human race has been gradually forging the chains of its own enslavement. This, while true, does not by any means lead to the anarchistic idea that all law is wrong. A world without law would be an unthinkable problem. And a civilization without statutes would be anachronism, for it would cease to be civilization and at once become the perfected type of barbarism.

This being granted, the question naturally presents itself, If law has thus from the earliest times been used as a promoter of good, has it not at the same time been a power in developing the moral side of humanity? The answer might be that indirectly it has been the means of increasing the comforts of life, supporting the weak and curbing the strong, and punishing the evil-doer. While it is possible that this would be the answer of the majority, it is by no means certain that enactments are to be credited with this improvement in the condition of all civilized peoples. Statutes are, or should be, the outgrowth of a popular need, but, unfortunately, they are more often the demand of the despotic will of a single individual or of the equally despotic power of a minority under a republican form of government. It is then proper to conclude that law within proper limits is a necessity, but that it never did and, it is safe to assume, never will make mankind moral through its stringent enactments. Until mankind comprehends the whole law of development and has studied evolution through all its changes, for good or ill, from the savage to the highly developed and perfectly rounded-out human creation, will degeneracy be a factor in human life and for which no remedy will be found in legal enactments.

The prisons, insane asylums, idiot asylums, and the entire list of constantly multiplying evidences, are an ever-present reminder that in respect to law civilization is a stupendous failure. It has been from time immemorial an attempt to remove a disease by force when the cause finds its root in the very origin of the race.

If these views be admitted, then it seems to the writer that this almost insane demand for law and more law should be brought to the test of reasonable discussion, for if there is any one thing to-day that needs the light it is the demand, constantly made, for an increase of law to effect a higher moral standard in the dental profession. If it has not this meaning, then it can have no value.

It is apparently the effort to bring all to a certain standard of ability, and thus to drive to oblivion all empirical workers fattening on the gullibility of the general public.

If this were possible, then law would gratefully be recognized as the most valuable adjunct of professional excellence; but, alas, the promoters of statutes forget the fact, briefly alluded to, that laws, severe or otherwise, are powerless to increase the moral force of the individual, and that therefore, in spite of these and their drastic conditions, the empirical exhibitor of show-cases will establish his institute of cheap wares in all the marts of civilization with more effrontery than ever.

It is a recognized fact with all conversant with college work that in every class there will be found several degenerates, who, while morally deficient, may possibly be brilliant intellectually. There is no power in faculties to determine this, and these men can pass out into the world easily escaping the net laid for them in the examining boards, and at once become the terror of respectable practitioners and the mortification of the college from which they have received their diplomas. The powers of evil are apparently wiser in their generation than the children of light, for they have taken the dental profession at its own standard, and are preparing themselves to meet all laws and all boards of examiners, in order that they may carry forward the detestable work for which they are morally fitted. This has become a notorious fact, and no law, no college standard, and no re-examinations will suppress these marauders upon the character of a reputable calling. It is said, and we presume with some degree of truth, that notwithstanding the State of New York has one of the most stringent laws, carried out to the letter by those deputed to enforce its provisions, that more empirical practitioners in dentistry are to be found in the metropolis than at any former period. This should be the legitimate result.

The older civilizations have practically given up the contest. Especially is this so in Germany, where freedom of trade was legally established many years ago, including dental practice, without the title. Hence the great growth of mechanical dentistry with its societies and literature casting in the shade, in quantity at least, the real professional work of the Zahnarzt.

The first appearance of law upon our statute-books regulating dentistry was born in Alabama in 1841. New York was the first State after Alabama to procure a special legislative enactment regulating the practice of dentistry in 1868. One month later Ohio

passed a State law, and in August, 1872, Georgia passed a similar law, followed by New Jersey in 1873, Pennsylvania in 1876. These enactments counted for little and made but slight impression upon the dental mind prior to 1875. The rush to acquire dental knowledge had not then begun; in fact, the dentists of the period were by no means equal in numbers to the rapid increase of population. The craze for law was intensified about the period of 1874, and after great difficulties some crude statutes were fastened upon our law-books, and then began the most remarkable demand, on the part of young men, for dental training. It is not probable that law had all to do with this, but it was coincident with the adoption of these stringent measures. From that day to this the rush for college instruction has not ceased, and from present appearances is likely to continue.

The editor of the *Dental Cosmos*, viewing this state of affairs, attributes it all to the growth of intelligent law, and very gravely asserts that "the salvation of our educational system depends upon the enactment of such legislative safeguards as will conserve our highest ideals and *prevent the licensing of practitioners who are a disgrace to their calling.*" (Italics ours.) He in another place says, "The proposition to do away with examining boards is a proposition to do away with legal restraint,—to do away with legal restraint is to establish anarchy." It is possible that years are not sufficient to carry the experience of the editor back to the period when every dentist was a law unto himself; when quackery had nothing to fear from officers of the law; when colleges knew nothing of a National Association of Dental Examiners; when graduates had only to dread the one examination. Then it was that anarchy reigned supreme, if the editor of the *Dental Cosmos* is to be credited, and every man's hand was raised against every other man. If it be true that the abrogation of all legal restraint would result as depicted, then it must have been the case when the profession was free from all law.

Fortunately for dentistry the pessimistic picture of the editor of the *Dental Cosmos* had no existence when freedom of professional action existed. The men who practised dentistry then were as truly infused with professional spirit as now, indeed more so. The practitioners of that day were as skilful as those of the present. The lines of professional ethics were as closely drawn then as now. It is folly then to assume that dentistry to-day is dependent on law for its very existence.

Our contention is not against law in general or the law of any

State in particular. The protest made here and in previous editorials is against the extension of a simple law regulating practice such as the original law of Pennsylvania. It is idle to assert that the present law, so much extolled, gives the power to find out the competency of the examining board. It practically does no such thing. It does give the right to examine the questions, and the council cannot go behind the report of the board, but "shall issue forthwith to each applicant who shall have been returned as having successfully passed said examination, a license to practise dentistry in the State of Pennsylvania." No power is given the council to decide upon the merits of the examination, whether it be good or bad. It does give the right to all interested to examine the questions, and as far as this goes it is an excellent provision, but suppose the questions are not what they should be. What then? Is there any power existing anywhere to displace these officials? Fortunately for Pennsylvania it has, at present, an excellent board, but it does not follow that this will be continued in the future.

The editor of the *Dental Cosmos* is on record for a decided opposition to the crude attempts of the National Association of Dental Examiners, and in his very drastic editorial, with the title of "Our National Beggar on Horseback," he demonstrated that he then possessed a keener appreciation of dabblers in law than he possessed when he penned his last editorial. Times change and men change with them, but, in the opinion of the writer, the law of right and justice endureth forever. We can make our standards for entrance to colleges as high as may be deemed advisable, but let not the graduating period of the hardy worked student, after his years of service, be made miserable by a body of men who neither know of what he may have endured or care for the result, whether that may be disastrous or not. It is time, as has before been asserted, that colleges were up and doing to protect their students from these law-makers who profess to believe that good men are made by legal enactments and that saints are the peculiar product of legislatures.

Bibliography.

A QUIZ MANUAL OF HISTOLOGY, GENERAL AND DENTAL. By Charles B. Reed, M.D., Professor of General Histology, Northwestern University Dental School, etc., and Frederick B. Noyes, B.A., D.D.S., Professor of Dental Histology (same school). Chicago: The W. T. Keener Co., 1897.

This is a thin volume of 203 pages, consisting, as its name implies, of questions and answers. The authors believe that in "an experience of some years in teaching histology . . . that such a manual as the present would be of value in giving him [the student] a better foundation for his subsequent study."

Criticism of the general contents of the book is not possible, for the questions and answers are framed each to suit the other, and are, of course, based on accepted knowledge. It is doubtful whether the average student would care to make a work of this kind a basis for study. Histological work tells its own story as the student proceeds in his investigations, and all important points are firmly fixed in his mind as he advances step by step with his microscope and reagents.

The most important use of such a book will be to those who study histology through a memorizing of facts, and as this is equivalent to no knowledge, it is impossible to see how this work can be of value to students. To the quiz teacher and to boards of examiners it would be invaluable, and for their use it is recommended without any reservations.

AN EPITOME OF THE HISTORY OF MEDICINE. By Roswell Park, A.M., M.D., Professor of Surgery in the Medical Department of the University of Buffalo, etc. Illustrated with Portraits and other Engravings. Philadelphia, New York, Chicago: F. A. Davis Company, publishers, 1897.

The history of professions is of profound interest, even to the laity, and this is especially true of medicine, for it means the history of the advances men have made from darkness to light, and the oftentimes ineffectual efforts to master the ills of humanity. The history of medicine, therefore, is practically the history of civilization, and, as the present century has witnessed the greatest advances in all directions of mental effort, it is not surprising that its

last half should have shown greater advances than at any equal period in its history.

The work of Professor Park would naturally be of value to medical men; but as the story is told in a style at once attractive and instructive, the reader is lured on from the first page to the last.

The author truly states in his preface that "the history of medicine is really a history of human error and of human discovery. During the past two thousand years it is hard to say which has prevailed. Notwithstanding, had it not been for the latter, the total of the former would have been vastly greater. A large part of my effort has been devoted to considering the causes which conspired to prevent the more rapid development of our art. If among these the frowning or forbidding attitude of the church figures most prominently, it must not be regarded as any expression of a quarrel with the church of to-day."

This history is largely made up from the characters that figured in medicine in various ages, differing in this respect from the "History of Medicine" by Robley Dunglison, M.D., which dwelt largely upon the various schools of medicine, relegating the exponents thereof to a secondary position. While this is true of the book as a whole, there is so much of interesting matter interwoven in its pages with these biographical sketches that the actual changes and the motives that induced these in the various periods are vividly portrayed.

In writing of Ambroise Paré, the author quotes this from his work on surgery: "For my part, I have dispensed liberally to everybody the gifts that God has conferred upon me, and I am none the worse for it, just as the light of a candle will not diminish, no matter how many may come to light their torches by it." If all connected with medicine and its specialties would adopt this noble sentiment, the professional spirit would be more in fact and less in name than at present.

The author's prejudices lead at times to narrowness of thought. Especially is this marked where he discusses the work of Gall and Spurzheim. "They thus founded the pseudo-science denominated phrenology, which we now know has practically nothing to justify itself." This, in all probability, settles the question in the author's mind, but will not in those who have intelligently examined the subject.

The book is enriched with a profusion of engravings taken from old paintings and portraits of distinguished men of all times in the

medical profession, ending with Lord Lister, M.D. A very excellent picture of Professor Gross accompanies this collection.

The compilation of such a work is a labor of great magnitude, but as it has been, undoubtedly, a labor of love, the reward must come in that direction. It should, however, be in the hands of all specialists in medicine, and this includes dentists.

The author devotes his closing chapter to this specialty, and says, "There is no reason why there is not more excuse for true oral surgeons than there is for any other class of specialists, save possibly those who treat the eye." The dental profession will not think the exception well taken, for while the assistance rendered by the ophthalmologist is of immeasurable value, that of the stomatologist covers not only the oral cavity but the entire digestive tract; and if his work is properly performed, he may influence for good the entire organism.

This work of Professor Parks must be regarded as one of the most valuable for reference, as it is full of facts not readily obtained elsewhere.

ABOUT CHILDREN. Six lectures given to the Nurses in the Training School of the Cleveland General Hospital in February, 1896. By Samuel W. Kelley, M.D., Professor of Diseases of Children in the Cleveland College of Physicians and Surgeons (Medical Department Ohio Wesleyan University); Pædiatrist to the Cleveland General Hospital; Consulting Physician to the Cleveland City Hospital; President, 1896 and 1897, Ohio State Pædiatric Society; Editor *Cleveland Medical Gazette*. 180 pages. Price, in buckram, postpaid, \$1.25, net. Cleveland: The Medical Gazette Publishing Company, 1897.

As the title indicates, these lectures were prepared for nurses, and this view disarms, in a great measure, adverse criticism, for a full consideration of the subjects could not be expected.

The diseases of children have received at all times the attention the subject deserved, and the valuable works published in the past attest the fact of their importance in medical practice and their value in its literature.

The author carries his hearers and readers through all the stages of infant life from the new-born to the final eruption of all the deciduous teeth, or between the second and third year. This period, though at times superficially treated, is, upon the whole, satisfactory. There are, however, very great lapses observable by the dental reader, which is not an unusual fact with medical writers,

for they frequently seem possessed with the idea that all knowledge came to them by virtue of their special work, the care of the human body, and that the acquirement of information from a special branch would be a lowering of the dignity of the profession. Had our author consulted the standard works of dentistry he would not have made a chapter on dentition as weak as the one in this book. The following quotation will illustrate this: "The popular opinion is that a child ought to have diarrhœa while teething, but this and other disorders should be attended to just the same during teething as at any other period. . . . The upper teeth are likely to cause more disturbance than the lower. It is true that the cutting of the 'eye-teeth' (the canines) may through their nervous connection affect the eyes," etc.

The author delivered this series of lectures to nurses, and these should have been informed of the possible pathological complications attending dentition, but while a few of the sequelæ of dentition are mentioned, not one word as to the cause or simple remedy. Patience has ceased to be a virtue in this persistently setting aside, by medical men, of known facts. If it were simply a matter of prejudice it might be left severely alone, but as negligence or profound ignorance of the subject endangers the lives of thousands of infants, the neglect becomes intolerable, and amounts to a crime.

It is to be hoped, if the author ever gets out a second edition, he will consult recognized authorities on dentition. It will give added value to an otherwise excellent work.

Obituary.

THE AMERICAN DENTAL CLUB OF PARIS.

RESOLUTIONS PASSED AT SPECIAL MEETING OF DECEMBER 11, 1897.

At a special meeting of the American Dental Club of Paris, held at the office of its president, Dr. G. C. Daboll, on Saturday evening, December 11, 1897, the following resolutions were unanimously adopted:

WHEREAS, By the sudden death of Thomas W. Evans, M.D., D.D.S., Ph.D., which occurred at his home in Paris, Sunday evening, November 14,

1897, this Club loses one of its most assiduous members, and our profession one of the most remarkable men that has ever graced its ranks; therefore be it

Resolved, That the American Dental Club of Paris deeply deplores the death of so eminent a colleague, who, as its first president and as a fellow-member, ever alert to the interests of the Club and the profession, always commanded the profound respect of all.

Resolved, That we as a body of American dentists whose lot by various circumstances has fallen in a foreign land, while gratefully acknowledging the hospitality of our sister republic, and our gracious adoption by her people, feel it but just to acknowledge our gratitude to Dr. Evans, who, as one of the great pioneers of the dental profession, has done so much to break down old prejudices and prepare the way not only for us, but for every dentist whose heart is in his work, and whose object is to benefit mankind.

Resolved, That we regard his success in securing the recognition, by all the nations of Europe, of the beneficence of dental science and art as first understood and practised in America, as of the greatest importance to the public, as well as to the dental profession.

That influence was strongest during the first twenty-five years of his practice, during the plastic period of the evolution of dental science so especially active in America.

On account of his influence in the highest circles, the way has been made easier to convert conservative Europe to modern methods of conservative dentistry, and not only every member of this Club and every American dentist of Europe, but every native dentist as well, has been benefited by that influence; and we believe, above all, by the adoption of modern methods, such a stimulus has been given to all dentists of all nationalities as will one day render dental science a *universal* and not merely a national science, as it was during a great portion of Dr. Evans's career.

Resolved, That while we recognize the influence of others of his contemporaries, he played a principal rôle, owing to the peculiar position brought by his unparalleled success, such success being due to his personal magnetism, high-mindedness, affability, practical common sense, and tact.

Resolved, That this Club regard the numberless honors conferred upon Dr. Evans by the various sovereigns of Europe, as the just tokens of appreciation of the dental profession through one of its great representatives, and it is proud that he was an American, and proud he was a member of this Club.

And, notwithstanding his pecuniary success, his unlimited honors, and his long sojourn away from his native land, we know that while being faithful to his duties in foreign lands his loyalty and affection for his own country never diminished.

He was first, last, and always a dentist, and proud to be considered one, and despised that *snobism* which makes some men ashamed of the profession to which they owe all their success in life.

Resolved, That we believe the name of Dr. Thomas W. Evans deserves a place with other great names in the history of the development of dental science.

Resolved, That our sympathy be extended to the relatives and friends of Dr. Evans; that a copy of these resolutions be handed them; that a full record

be made and preserved by the secretary of the Club in its procedures; and that a copy be sent to the dental journals of America for publication.

Resolved, That as a token of respect to our late *confrère*, the American Dental Club of Paris join in a body to attend his funeral.

JOHN W. CRANE,
ISAAC B. DAVENPORT,
J. H. SPAULDING,
Committee.

Current News.

TENTH ANNIVERSARY OF THE ODONTOGRAPHIC SOCIETY OF CHICAGO.

THE Odontographic Society of Chicago, the largest dental association in the United States excepting the American Dental Association, will celebrate its tenth anniversary February 21 and 22, 1898.

We shall spare no effort to make the event memorable in every respect, and to that end have planned a convocation which shall extend over two days, and consist of clinics and scientific papers from men specially distinguished and representative in the science and dentistry.

C. E. BENTLEY,
Chairman Executive Committee.

100 STATE STREET, CHICAGO, ILL.

ODONTOGRAPHIC SOCIETY OF CHICAGO.

THE election of officers for the ensuing year of the Odontographic Society of Chicago resulted as follows:

President, G. W. Schwartz; Vice-President, H. J. Goslee; Secretary, F. H. Zinn, 70 State Street; Treasurer, George N. West.

Member of Board of Directors, B. J. Cigrand.

Board of Censors.—E. K. Bennington, A. G. Johnson, F. E. Roach.

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Original Communications.¹

THE CONNECTION BETWEEN DISEASES OF THE EYE AND DISEASES OF THE TEETH.²

BY CHARLES STEDMAN BULL, A.M., M.D., OF NEW YORK.

THE relation which is supposed to exist between affections of the teeth and diseases of the eye has been familiar to us all for many years, and the belief in its existence is almost as old as the science of medicine itself. The difficulty has always been to explain exactly what this connection is, and how the diseased process is propagated from the mouth to the eye, or, in the reverse direction, from the eyes to the mouth.

Attempts have been made to classify the lesions of the eye which are supposed to be of dental origin by dividing them into two classes,—viz., those lesions which are of reflex origin and those which are of an inflammatory nature. All such attempts, however, have been generally too vague and too positive, too schematic; for a reflex lesion may later become an inflammatory lesion, and must thus come to be regarded as the irritative phase of an inflammatory phenomenon. In these latter days of what may be called the "microbic craze" we are, perhaps, too prone to consider the so-

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before The New York Institute of Stomatology, January 4, 1898.

called reflex lesions as more likely to be of microbic origin, thus restricting the reflex ocular phenomena within still narrower limits.

Attempts have been made in the past by the advocates of the reflex theory to regard all lesions of the anterior segment of the eyeball, in cases of dental disease, as due to some disturbance of the trifacial nerve; while lesions of the posterior part of the eyeball are considered to be of an inflammatory, infectious nature, propagated directly from the diseased teeth or upper jaw to the orbit, and thence to the eyeball. This is a fanciful classification which is not justified by our clinical or pathological knowledge.

It is probable that lachrymation, due to irritation of the terminal filaments of the trifacial nerve, is of reflex origin, as may be also amblyopia with peripheral narrowing of the visual field. In the latter case, however, it is possible that the irritation may be propagated by inflammation along the optic canal, where the optic nerve may be compressed or inflamed by the septic elements of inflammation, infected, and thus give rise to defects of vision and a narrowing of the visual field.

It is very possible that a dental lesion causing a sensitive impression in the trifacial may reach the great sympathetic nerve, or the ciliospinal centre, or even the bulbar enlargement of the cord, and give the impulse to a greater or less number of neurons, according to the degree of impressionability of the subject or for other reasons. Any or all of these reasons would suffice for the retention of the sensitive impressions in several nuclei and the production of varying motor or vasomotor phenomena.

Congestive phenomena of reflex origin, by means of irritation of the filaments of the trifacial, are said to cause dilatation of the vessels of the eyeball, and even to set up keratitis and iritis. This, however, is by no means certain, and is more than doubtful. It would seem more rational to believe, for example, in a case of empyema of the maxillary antrum due to dental caries, followed by iritis, that an infectious osteoperiostitis had ensued, with metastasis of the pus through the medium of the blood-vessels and lymphatics, to the tissue of the iris and choroid. This method of propagation has not yet been proved to occur, but it is highly probable. It is not yet positively known that infectious microbes coming from a suppurating focus must always set up the same suppurative inflammation in a new tissue when carried there by the vessels and lymphatics. Cases of iritis occurring in the course of abscess of the maxillary antrum with dental caries are probably of pure microbic

origin. Mere conditions of irritation and congestion of the eye may be the starting-point of a microbic infection.

We know that infection of dental origin may extend to the sinuses of the face, not only the antrum, but the frontal sinus, ethmoid sinus, or sphenoid antrum, by the natural opening into each of these sinuses. Infectious inflammation of the maxillary antrum, consecutive to an alveolar dental periostitis, frequently extends to the orbit, and these cases of cellulitis of the orbit are due in most instances to periostitis of the floor of the orbit extending from the antrum. The pus may extend to the orbit by stripping the periosteum from below upward, or, more frequently, through the medium of the communicating veins. The veins of the maxillary sinus and of the periosteum of the upper jaw open generally into the ophthalamo-facial vein, which, coming from the pituitary membrane, passes through the sphenopalatine foramen, anastomoses with the intraorbital veins, and empties into the facial vein below the level of the malar bone. Inflammation of this vein, of microbic origin, might of itself cause a thrombophlebitis of the cavernous sinus. The inflammatory process might also follow the course of the lymphatics. Thus alveolar dental periostitis may cause thrombophlebitis of the cavernous sinus and secondary orbital phlebitis, not only when starting in the superior maxilla but also when confined to the inferior maxilla.

An interesting fact has been brought out by Reynier and Parinaud. They have proved that in certain cases of orbital cellulitis from alveolar dental periostitis and abscess of the antrum, the pus does not reach the orbit by stripping up the periosteum, for there is no periosteum. The pus spreads through the bone itself. Pus starting in an alveolus may perforate it; but, on the other hand, it may not destroy the alveolar wall, but pass through the canaliculi or foramina at the apex of the alveolus, and thence into the infra-orbital notch, or through one of several orifices situated in front of the lachrymal sac, in the ascending ramus of the superior maxilla. These orifices often communicate directly with the nasal fossæ or antrum, so that the pus coming from a carious alveolus may reach the orbit either by passing through the sinus or by avoiding it.

In children the maxillary sinus is much smaller than in the adult, and does not bear the same relations to the orbit. It is effaced in part by the development of the alveoli of the first and second dentition. The relation of these alveoli vary with the age of the subject; but in some cases the alveolus of second dentition

may extend as far as the orbital arch. In the case of the canine tooth, the alveoli of the first and second dentition, more or less exactly superimposed, the one on the other, often communicate with each other by an orifice, which gives passage to both nerve and vessels, and later, by the absorption of the wall of separation, the one resulting alveolus ascends as far as the orbit.

In both children and adults the infectious focus may remain localized, or it may spread by various channels more or less rapidly and gain progressively the sinuses of the face and base of the skull, through the veins of the optic foramen or vault of the orbit.

It would seem wiser to give up any attempt to classify the ophthalmic lesions met with in connection with morbid processes in the teeth, and to consider the subject under two heads: *First*, lesions of the eye met with in the course of primary and secondary dentition. *Second*, lesions of the eye occurring in the course of abnormal diseased processes in the teeth.

First. Lesions of the eye met with in the course of dentition, both primary or early and secondary: The connection existing between certain affections of the eye and early dentition is very close, and is recognized by all practising physicians. Some of the ocular manifestations met with in the course of early eruption of the first teeth are sympathetic in nature and probably reflex in origin, such as photophobia and lachrymation. Others are of a distinctly inflammatory nature, though also reflex in origin, such as the various forms of ulceration of the cornea and conjunctiva. Catarrhal conjunctivitis, phlyctenular conjunctivitis and keratitis, ulcers of the cornea, lagophthalmos from spasm of the levator of the upper lid, marginal blepharitis, mydriasis, and a peculiar form of cataract are affections of the eyes not infrequently met with during early dentition. Many authors have cited such instances. Sous, in the *Journal de Médecine de Bordeaux*, 1896, reports an obstinate case of keratitis during early dentition. Auge, in 1881, published a paper on blepharoconjunctivitis during teething. Foucher, in 1895, published cases of herpetic conjunctivitis; as have also Tavignot, in 1871, Galezowski, in 1888, Chevalier and Décaisne, in 1869, and, more recently, Knies, in 1895. The case reported by Sous is interesting. A child was attacked by diffuse keratitis of the right eye, and a cure followed lancing of the gums. In the following year the left eye became inflamed in the same way, and the process involved not only the cornea but the sclera also. A tooth was removed to allow a deviated tooth to take its normal position, and in three days the

cornea had resumed its normal transparency and all signs of inflammation vanished. All these so-called superficial inflammations of the eye are generally considered to be reflex, and are relieved and generally cured by incisions in the swollen gums. I have under my care at present a child, aged ten months, in excellent physical condition, with good digestion, who for nearly three months has had a series of phlyctenular ulcerations on the margin of the cornea in both eyes, appearing in groups, and accompanied by great photophobia and considerable general conjunctivitis, and very pronounced swelling and engorgement of the gums. Local treatment has proved of little use, but on every occasion after lancing of the gums there has been an immediate improvement in the photophobia and the ulcers began to heal. The teeth have pushed themselves forward very rapidly, and with each new attack of swelling of the gums a fresh crop of small ulcers have appeared on the margin of the cornea.

One of the most interesting ocular lesions met with in connection with difficult early dentition is the zonular cataract. Horner was one of the first to call attention to this in 1864, and he supposed it to be due to the influence of infantile rickets. Arlt first noticed the coincidence of infantile convulsions and zonular cataract, and thought that in the convulsions met with during dentition some solution of due physiological contact took place between the denser central portion and the more fluid peripheral portion of the lens, and that this mechanical lesion manifested itself as a stationary zonular or lamellar opacity. Horner noticed that these patients showed cranial deformities and malformation of the first teeth, which he attributed to rickets. Out of sixty-five cases of zonular cataract, forty-eight had infantile convulsions, and in thirty-six cases there were dental and cranial deformities. The teeth are thick and coarse, the incisors are cubical, and the enamel terminates abruptly on the neck of the tooth in a swollen ridge. The horizontal furrows in the enamel become visible to the naked eye, and near the cutting edge a horizontal row of round holes marks the position of one of these excavated grooves. The body of the tooth terminates in a convex border at the cutting edge. Sometimes the enamel is wanting in the grooves and the discolored dentine shows through. Story, in 1886, reported nine cases. He does not believe that rickets is always the cause. The dental defect is due to an arrest of development. The period of the growth of the enamel is of limited duration, somewhere between the sixth and the ninth month. He thinks that there is a close similarity between the lens

and the dental enamel in origin and development, and that it is, therefore, natural that they should be affected by the same pathological agents. Both are formed by an involution of the epithelium from the surface of the embryo, and in both the growth proceeds from the deeper layer of this epithelium, when separated from the rest of the epiblast by the interposition of a mesoblastic layer. There is this difference, however: the enamel organ has only a brief functional existence and then disappears, but the growth of the lens proceeds during many years.

Hutchinson published a paper in the *Lancet* in 1875, in which he stated that these imperfect teeth were, as a rule, met with only in connection with the zonular cataract of early childhood. The latter was always symmetrical and quite stationary, and was not associated with any particular diathesis. The defective development of the teeth was seen in the incisors, canines, and first molars, the latter being the test-teeth. The bicuspid usually escape. In contradistinction to Story and Horner, he believes that the permanent teeth are alone affected. The incisors and canines are pitted, dirty, and rough, with spinous edges. The non-development of the enamel and the erosion of the exposed dentine are the essential features. With these teeth and the zonular cataract there is usually a history of infantile convulsions.

Some have held that these dental defects usually result from inflammation of the gums in infancy, and that mercury is the chief cause, the mercury having been administered during the period when the enamel was undergoing calcification.

Hutchinson believes that the connection between zonular cataract and convulsions is universal. Weiss (1876) holds the same views. The general testimony seems to be in favor of the view that when zonular cataract is found with a history of convulsions, the permanent teeth will certainly be malformed. The distinct characteristic of a genuine "convulsion tooth," unaffected by congenital syphilis, is the shortness of its enamel, the dentine projecting beyond the enamel edge and being more or less honey-combed.

Second. Lesions of the eye occurring in the course of diseased processes in the permanent teeth: The reflex theory has many strong advocates, one of the most recent being Knies (1895) and from the time of Mackenzie, in 1833, down to the present day most writers on ophthalmic diseases have given more or less adhesion to the doctrine. It is only when we reach the period of bacteriological investigations that the reflex theory of origin begins materially to lose ground.

Leber (Graefe und Saemisch, *Handbuch der gesamten Augenheilkunde*, vol. v., 1877) reports numerous observations of the occurrence of visual disturbance through irritation of the extraocular branches of the trigeminus in diseases of the teeth, such as simple dental caries with severe continuous toothache and sensitiveness of the tooth to pressure, or suppuration in the alveoli with prolongation of the inflammation to the antrum. The teeth involved are generally in the upper jaw, and usually the molars. The eye symptoms are photophobia, retinal hyperæsthesia, photopsia, loss of accommodation, and, more rarely, amblyopia and amaurosis. All these symptoms simulate sympathetic troubles. The ophthalmoscopic evidence may be negative, though occasionally there are signs of retinitis and optic neuritis.

Desmarres (1858) believed that there was a real pathological connection between diseases of the eye and diseases of the teeth, and that the connection might be either direct by continuity of tissue or reflex through the nervous system. The lesions on the side of the eye might be either organic or functional.

Nuel (Wecker et Landolt, "*Traité Complet des Maladies des Yeux*," vol. iii., 1887) is even more positive in his statements. Generally the superior dental nerves are involved. If amblyopia is really present, one or more molars in the upper jaw will be found sensitive. If the superior dental nerves are involved, there will always be conjunctival and ciliary injection, with ciliary neuralgia, lachrymation, photophobia, and sometimes blepharospasm and spasm of accommodation. Nuel considers these symptoms all reflex: reflex vasomotor dilatation in the conjunctival and ciliary vessels, reflex contraction of the muscles of the face, and reflex innervation of the lachrymal gland. If amblyopia exist, there is usually also narrowing of the visual field, and the vision becomes worse with each fresh attack of dental neuralgia.

Galezowski (1872) is an advocate of the reflex theory, but believes that the reflex influence is exerted not in the brain but in the ganglion or node of Gasse, and works in both ways, from the teeth to the eyes and *vice versa*.

Without quoting the names or opinions of the long list of authors who have expressed their views on the subject, it seems to be definitely settled that a relation exists between certain lesions of the eye and certain diseased conditions of the teeth. Knies formulates the modern views as follows:

1. Conjunctivitis of the phlyctenular variety is known to be intimately connected with teething, even with the second dentition.

2. It is undoubtedly true that keratitis, iritis, glaucoma, muscular paralysis, asthenopia, amblyopia without visible lesion, supra-orbital neuralgia, and exophthalmos with and without orbital cellulitis, are caused directly or indirectly by carious teeth.

3. When paralysis of accommodation appears during an attack of toothache it probably results simply from the lack of vigorous innervation on account of the distressing pain.

4. Muscular insufficiency or paralysis, with diplopia, may also be explained as paresis due to enfeebled innervation.

5. Spasm of accommodation and nictitation are both reflex symptoms frequently observed with toothache, as is also neuralgia of one or more of the branches of the trifacial nerve.

6. Amblyopia and amaurosis are by no means infrequent complications of carious teeth. Any positive ophthalmoscopic evidence should lead us to assume a common cause for the dental pain and the visual disturbance.

7. A spasm of the levator muscle of the upper lid leading to the appearance known as lagophthalmos has not infrequently been described in connection with pain in carious teeth.

8. Orbital cellulitis with development of abscess in the lower lid has been noted in caries of the teeth of the upper jaw with the development of abscesses round the diseased teeth.

9. Exophthalmos, or protrusion of the eye, may be caused by serous infiltration of the orbital tissue directly connected with disease of the alveoli.

10. Conversely, pain in the teeth of the upper jaw is by no means an infrequent symptom in iritis and cyclitis with severe neuralgic pain in the branches of the trifacial nerve; and toothache has been unmistakably recognized as one of the prodromal signs of glaucoma.

For the sake of convenience we may perhaps divide the lesions of the eye met with in connection with lesions of the teeth into three groups, as follows:

1. Those dependent on vasomotor disturbances, which would include all cases of disturbance of nutrition, all inflammatory cases, and the reflex cases, such as amblyopia and amaurosis without ophthalmoscopic evidence.

2. Those dependent on disturbances of sensibility, such as ciliary neuralgia and the various forms of asthenopia.

3. Those characterized by disturbances of motility, including all cases of spasm and paralysis of the muscles of the eye, including the iris and ciliary muscle.

The eye-complications of dental disease are of varied nature. Beginning with the most superficial structures of the eye, the first subject that will engage our attention is the *eyelids*.

Herpetic eruption of the lids in the course of the terminal branches of the fifth nerve is often met with in connection with carious teeth, and resists all treatment until the teeth are extracted or properly filled.

Hutchinson has reported an interesting case of constant spasmodic contraction of the levator of the lid in a lady who had four decayed molar teeth in both jaws on the corresponding side. These were removed, and all ciliary neuralgia at once ceased, but the spasm remained. The left upper first molar contained an amalgam stopping, which, on being removed, revealed an exposure of the pulp. This tooth was also removed, and improvement in the muscular spasm began at once, and it shortly stopped altogether. This may be regarded as purely reflex.

On the other hand, Redard has reported a case of paralysis of the levator of the lid which resisted all treatment. A careful examination of the mouth showed extensive caries of the upper third molar, and, on this being removed, the paralysis began to improve, and in a few days the lid had completely regained its power.

Ely has reported a case of paresis of the orbicularis muscle associated with spasm of the ciliary muscle in a patient with an abscess at the root of the third upper molar on the right side. This tooth was extracted, and the ocular symptoms immediately disappeared.

When we come to consider the lesions of *cornea* and *sclera*, the number of cases reported in connection with diseased teeth is almost numberless. Ulcers of the cornea, superficial and interstitial keratitis, and scleritis are repeatedly mentioned. Marginal phlyctenular keratitis is a very common accompaniment of early and second dentition as well as of carious teeth in the adult. Ely reports a typical case in a man aged thirty-five, who had severe neuralgia of the right side of the face, with ulcer of the conjunctiva and scleritis of the right eye. There was in the right upper canine tooth an ulcerated spot just below the gum, and the nerve was exposed. The nerve was destroyed, the ulcerated spot treated, and the neuralgia ceased at once, and in a few days the eye became perfectly well. Hern has also reported a number of cases of scleritis of undoubted dental origin. *Iritis* has also been observed in connection with interstitial keratitis in cases of carious teeth, and the teeth being properly cared for, the iritis promptly got well.

The loss of accommodation due to paralysis of the ciliary muscle has received special attention from several authors.

Schmidt-Rimpler (Graefe und Saemisch, *Handbuch der gesamten Augenheilkunde*, vii. p. 72, 1877) gives the results of his experience in ninety-two cases, and draws the following conclusions:

1. In consequence of the pathological irritation of the dental branches of the trifacial nerve there may result more or less marked limitation of the range of accommodation.

2. These limitations of accommodation may be either unilateral or bilateral. When unilateral, they always appear in the eye on the affected side.

3. These limitations of accommodation occur most frequently in the young, while at an advanced age they occur rarely or never.

4. They are due to an intraocular increase of tension, proceeding from a reflex irritation of the vasomotor nerves.

In seventy-three of the ninety-two cases reported, the accommodation was diminished far below the normal standard. In most of the cases the accommodation was regained after the removal of the trouble in the teeth, either by the cure of the carious process or by the extraction of the diseased teeth. The degree of limitation of the accommodation varied greatly.

Schmidt-Rimpler believes that the irritation of the branches of the trigeminus due to carious teeth causes in a reflex manner an irritation of the vasomotor nerves of the eye, and that irritation of these vasomotor nerves produces an increase of the intraocular tension, which diminishes the accommodation.

Ely (*New York Medical Record*, March 11, 1882) reports in detail the case of a man, aged thirty-one, who had not only paralysis of accommodation in the right eye, but also paralysis of the right internal rectus muscle. The root of the first upper molar tooth on the right side was denuded, rough, and sensitive. The nerve of the tooth was dead, the alveolar process was absorbed, and there was extensive suppuration in the adjacent parts. The condition of the tooth was rectified, and the symptoms all disappeared.

Galezowski (*Progrès Médicale*, No. 29, 1888) has an article in which he draws similar conclusions to those of Schmidt-Rimpler.

Dunn (*American Journal of Ophthalmology*, October, 1891) reports a case of paralysis of accommodation, with impaired vision and severe ciliary neuralgia in a patient, who was found to have an abscess at the root of the second molar tooth in the lower jaw on the left side. The tooth was extracted and the alveolar cavity

antiseptically treated, and in a few days all the ocular symptoms entirely disappeared.

When we come to consider the subject of amblyopia and amaurosis, whether reflex or not, in connection with the existence of carious teeth or lesions in the jaw, the list of authors becomes very large. From the date of publication of Mackenzie's "Treatise on Diseases of the Eye," in 1833, to the last edition of Swanzy's "Hand-Book of Diseases of the Eye," in 1897, scarcely a text-book has appeared which does not treat more or less distinctly of the subject. Hocken in 1842 published a treatise on amaurosis, in which a number of cases are reported as due to carious teeth. Most of the cases reported have been associated with dental neuralgia of the molars of the upper jaw, and the lesion has been caries, sometimes complicated by abscesses of greater or less extent at the roots of the teeth. It should be understood that all cases of amblyopia or amaurosis considered under this head have been those in which no ophthalmoscopic evidence of disease has ever been noticed from the beginning to the end of the trouble. There is usually lachrymation, photophobia, conjunctival or ciliary injection, and occasionally spasm of accommodation, but the fundus remains healthy. The defect of vision may be unilateral or bilateral, and when the latter exists the vision is always worse on the side corresponding to the diseased teeth. If the defect in vision is marked, the field of vision is usually concentrically narrowed, and both vision and limitation of the field of vision become worse with each exacerbation of the neuralgia. The photophobia in these cases is due to the existing retinal hyperæsthesia.

Park (*Annals of Ophthalmology*, January, 1893) has reported a case of a patient who complained of headache, loss of vision in the right eye, and some photopsic manifestations. A few days later vision in the right eye was reduced to perception of light. The ophthalmoscopic examination was negative. There was concentric narrowing of the field of vision. An examination of the mouth revealed five decayed teeth in the right upper jaw, and an artificial plate was found resting and pressing on the decayed roots. The roots were all extracted, and vision began to improve at once, and in two months was completely restored.

In the *Courier Médical* for 1890 will be found the report of a case of a lady, aged thirty, who complained of failing vision in the left eye accompanied by severe toothache in the second left upper molar tooth. In one week from the onset of the attack the left eye became entirely blind, without any ophthalmoscopic evidence

of disease. The diseased tooth was extracted, and pus immediately flowed from the alveolar cavity. Examination revealed a small piece of wooden toothpick, which was removed from the cavity, and in a few days there was complete restoration of vision.

I have recently had under my care a lady who presented herself complaining of lachrymation, photophobia, and loss of accommodation in the right eye. In two days vision in this eye began to fail, and the field of vision became concentrically narrowed. Repeated ophthalmoscopic examinations revealed nothing abnormal. In about a week from the onset severe neuralgia of the right side of the face set in. She was sent to her dentist, who discovered that the second molar in the right upper jaw, which had been filled, was very sensitive to pressure. The filling was removed and the nerve found inflamed. At this time the vision had been reduced to perception of light. The nerve was destroyed and the cavity was again filled. The neuralgia, lachrymation, and photophobia ceased at once, and in less than a week vision was completely restored, and the field of vision regained its normal extent.

Proceeding next in the course adopted, from without inward, from the superficial affections of the eye to the deeper and more serious lesions, in connection with diseased processes in the teeth, we come to consider *inflammation of the optic nerve, or optic neuritis*, including the immediately surrounding zone of the retina. Of this disease we have a number of undoubted cases on record.

In 1893, Hermann (*Centralblatt für Praktische Augenheilkunde*, December, 1893) reported a case of inflammation of the optic nerve of the variety known as papillitis, occurring in a patient in whom no cause for the lesion could be found until the teeth were examined, when a carious tooth was found accompanied by toothache. Unfortunately, the extraction of the tooth and the cure of the suppurative process had no beneficial effect upon the inflammatory process in the optic nerve.

Despagnet (*Annales d'Oculistique*, May, 1893) reports a very clear and interesting case occurring in a woman, aged twenty-four, in whom there was optic neuritis with dilatation of the iris. An examination of the mouth showed caries of the last molar of the upper jaw on the corresponding side, with extensive periostitis of the alveolar process and a sequestrum of the alveolar arch. There was suppurative inflammation in the antrum directly connected with the diseased alveolus, and the suppurative process was found to have extended to the orbit as far back as the foramen opticum and here had involved the optic nerve.

Hirsch (*Wiener Medicinische Wochenschrift*, 1893, No. 34) reports a case of optic neuritis ending in atrophy of the nerve and blindness, in which the disease evidently started in the left second upper molar. There was an extensive abscess involving the gum, cheek, and lower lid, which had perforated externally. A probe could be passed from the external opening in the cheek along the floor and inner wall of the orbit. The infection had extended from the tooth-cavity and set up alveolar periostitis, which had involved the antrum and floor of the orbit, and set up orbital cellulitis, inflammation, and eventually atrophy of the optic nerve.

Feuer (*Annals of Ophthalmology*, 1895) reports two cases of optic neuritis ending in a complete cure and restoration of vision after extraction of the carious teeth. In the first case there were three decayed teeth with osteoperiostitis of the alveolar arch and antrum, with exophthalmos and optic neuritis. In the second case the wisdom-tooth in the right upper jaw was diseased, with periostitis of the alveolar arch and of the floor and inner wall of the orbit. The loss of sight was complete in the right eye, and coincided with the occurrence of inflammation and pain in the orbital floor. The vision was completely restored in three months.

Cases of this sort might be multiplied almost indefinitely, but enough have been presented to show the connection which actually exists between diseased teeth and the inflammation of the optic nerve.

Choroiditis, or inflammation of the choroid coat of the eye, has been mentioned by a number of authors as occasionally due to reflex irritation from a decayed tooth, and several cases have been reported. One of the most notable cases is reported by Sous in the *Journal de Médecine de Bordeaux* for 1896. The patient was a girl, aged twenty, who complained of failing vision in the right eye. An examination showed both keratitis punctata and choroiditis. The first right upper molar was carious and had been recently filled, but was still painful. Pressure on this tooth caused an acute pain in the eye. The filling was removed and vision began at once to improve, the keratitis rapidly disappeared, and within a week the choroiditis was gone. The tooth was then refilled, and on the next day there was a return of all the symptoms. The filling was again removed, and the symptoms again rapidly disappeared. Here the irritation of a dental nerve acted in a reflex manner upon the sensory ophthalmic nerves and set up a secretory choroiditis.

Anomalies of the ocular muscles in connection with dental lesions have been repeatedly reported, and the writer of this paper has seen several such cases.

Terrier (*Recueil d'Ophthalmologie*, 1876) has reported a very obstinate case of spasmodic contraction of the motor muscles of an eye and of the orbicularis muscle of the eyelids, which was entirely relieved by extraction of the carious teeth.

Hutchinson (*British Medical Journal*, December, 1895) reports a case of lagophthalmos due to dental irritation. The patient, a lady, suffered from marked spasm of the left upper eyelid. The left second and third molars in both jaws were badly decayed, and there was intense left facial neuralgia in all the branches of the fifth nerve. All four teeth were extracted, and the neuralgia ceased at once, but the spasm of the lids continued. The left first upper molar had an amalgam stopping; this was removed and the pulp found exposed. This tooth was removed, and an improvement in the muscular spasm of the lids began at once, and in six months it was entirely cured.

Ely (*New York Medical Record*, March, 1882) reports a case of a woman, aged forty, who had marked paralysis of the right third nerve or oculomotorius. Several decayed teeth were found in the right upper jaw, and the gums were badly swollen. The teeth were extracted, the alveolar cavities and gums were treated antiseptically, and the symptoms of muscular paralysis all disappeared.

The subject of periostitis of the bones of the orbit, as a consequence of periostitis of the alveolar arch due to decayed teeth, is so intimately connected with orbital cellulitis that the two will be considered together. These constitute some of the most serious cases, not only as regards danger to the integrity of the eye, but also to the life of the patient, whichever fall under the observation of the oculist. Hirsch, Péchin, Juler, Schwendt, Pagenstecher, Vossius, Burnett, Snell, Fage, and many others have all reported cases.

Schwendt published an inaugural dissertation on orbital cellulitis in 1882, in which he collected the reports of forty-four cases, of which seven were directly due to carious teeth. The cellulitis was generally preceded by abscess of the antrum, periostitis of the floor of the orbit, and sometimes by suppuration in the ethmoid, with discharge of pus from the nose.

Vossius, in 1884, reported a case of orbital cellulitis with thrombophlebitis of the orbital veins and optic neuritis, with complete restoration of vision after extraction of a carious molar. This case was probably due to a rapid infectious inflammation of the veins and lymphatics with thrombosis, through the alveolar veins

into the antrum, and thence by a branch which perforates the floor of the orbit and empties into the infraorbital vein.

Snell, in 1890, reported to the London Ophthalmological Society the case of a young girl, aged fourteen, who had two decayed teeth in the upper jaw, which were extracted and periostitis found in the alveolar arch. Acute orbital cellulitis followed, and the orbital tissue was freely incised, giving exit to a large quantity of pus, but death followed in a few days from meningitis.

Fage (*Receuil d' Ophthalmologie*, 1893) reports the case of a man, aged twenty-nine, who applied for treatment. There was protrusion of the left eye with marked chemosis, cedematous lids, dilated iris, and the cheek swollen and painful. There was fever and a fetid odor to the breath. The gums of the left upper and lower jaws were swollen and there were several carious teeth. The first left upper molar was wanting, having been removed a few days before on account of severe toothache. The symptoms became rapidly worse, and the orbital tissue was freely incised, but no pus appeared. An incision in the lower lid gave exit to fetid pus. A probe passed freely through the alveolar cavity of the first molar into the antrum, and pus flowed from the latter. This treatment, together with antiseptic irrigation, brought about a rapid recovery.

Galezowski reports a somewhat similar case, occurring in a young woman, aged twenty. He comments on the rather marked frequency of alveolar abscess due to carious teeth, he having seen nine cases in two years among seventeen thousand cases of eye-disease.

There seems to be no doubt that in addition to the rather benign reflex disturbances in the eye accompanying more or less serious disease in the teeth and jaws, we also not infrequently meet with grave ocular lesions due to an infectious process, and here our anatomical knowledge enables us to follow the channel of propagation accurately. I think it may be stated that the primary evil starts in the periosteum around a carious alveolus, develops at first slowly, and if recognized and properly treated, it may be cured without an abscess. If, however, the alveolar dental periostitis extends to the antrum, the next step will be an abscess of the antrum, periostitis of its walls, including the root of the antrum or floor of the orbit, which, in its turn, sets up orbital cellulitis, ending in supuration, with possible destruction of the eyeball from panophthalmitis, or inflammation of the optic nerve and atrophy from strangulation of the nerve by pressure.

The various steps in the destructive process here outlined are

well illustrated in the report of a single case, published by Juler in 1895 (*British Medical Journal*, October 19). A boy complained of pain in one of the upper molar teeth, and this toothache was followed by pain in the jaw, then by pain in the orbit, exophthalmos, orbital cellulitis, and suppurative panophthalmitis, and total destruction of the eye. The tooth was extracted, and was found extensively diseased, with caries of the alveolar wall, periostitis, abscess at the root of the tooth communicating with an abscess of the antrum. The eye was enucleated, and the floor of the orbit was found extensively diseased, with a large hole communicating with the cavity of the antrum.

In this somewhat rapid sketch of a subject of almost equal interest to both dentist and oculist, there does not seem to be any reasonable doubt of the close connection which exists between certain diseased processes in the eyes and certain abnormal physiological and pathological conditions of the teeth. The modern ophthalmologist certainly recognizes the existence of this connection, though he perhaps has not insisted upon it sufficiently in the published literature.

THE PLACE OF LOCAL ANÆSTHESIA IN SURGERY.¹

BY F. B. LUND, M.D., BOSTON, MASS.²

OF the advantages offered by local anæsthesia, as compared with general anæsthesia in a large class of surgical operations, there is no need for me to speak before this assembly. Suffice it to say that early in my experience as a medical student I became so convinced of the value of local anæsthesia by hydrochlorate of cocaine, in enabling me to do away with the nauseating effects of general anæsthesia,—the vomiting, dizziness, delirium, and general weakness,—which are so unpleasantly associated with ether in the minds of many patients, that in case of subsequent operations they sometimes prefer, if the operation is a slight one, to suffer it without anæsthesia rather than be etherized, that I have always been an earnest student of methods of local anæsthesia as applied to surgical practice.

¹ Remarks before the American Academy of Dental Science, December 1, 1897.

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The experiences of eight years in the use of local anæsthesia in minor surgery, for which I have had during the past three years the extensive opportunity furnished by the large out-patient clinic at the Boston City Hospital, have given me such definite views as to the use and abuse of local anæsthesia, the class of cases in which it should be employed, and the technique which is essential to give good results, that I have thought it might not be uninteresting to you, even though I am compelled to confess my entire ignorance of local anæsthesia in dental surgery, to hear what I have found to hold true with regard to its use in a general surgical practice. I have had a certain amount of experience in the use of local anæsthesia in major as well as minor operations, and I think you will agree with me that even in the former it has a distinct and legitimate field.

The various methods of producing local anæsthesia which have been up to the present time employed will be found to divide into but two fundamental classes,—first, those which depend upon numbing the part by freezing mixtures and evaporating spray; and, second, those which depend upon bringing some drug having local anæsthetic properties in contact with the terminal filaments of the sensory nerves. Of local anæsthesia by cold it is not necessary to speak, save to say that, although much older than other methods, it has always failed to find an extensive field of usefulness,—first, owing to the transitory nature of its effects, which renders it unavailable for operations requiring more than a few seconds for their performance; and, secondly, owing to the fact that the processes of freezing and thawing, more particularly the latter, are both exceedingly painful, so that, even if we have anæsthesia or absence of pain during an operation, we certainly do not have it either before or after it. Since 1884, when Köller, of New York, then a medical student in Vienna, discovered the local anæsthetic effects of cocaine upon the mucous membranes, that drug and other synthetical compounds which have recently followed it have vastly extended the field for local anæsthesia in surgery.

It was found that, although cocaine was effective upon mucous membranes by direct absorption from their surface, its use upon intact skin required hypodermic injection in order to be effective. The hypodermic injections in the early days were made with strong solutions,—eight to ten per cent.,—such as were used as applications to mucous membranes; and it was soon found that, owing to the toxic properties of the drug, but small amounts could be safely injected, so that only very brief operations could be performed

under cocaine, without danger of producing constitutional effects. Occasional reports of cases of poisoning made surgeons chary of the use of cocaine, and when they did use it, so small was the amount of fluid injected that the operative field was seldom fully permeated with the drug, and anæsthesia often failed to appear. The technique employed was to inject a few drops of the strong cocaine solution in the neighborhood of the field of operation, and then wait for the anæsthetic fluid to soak into the surrounding parts. This procedure was modified by Dr. Leonard J. Corning, of New York, who was the first to demonstrate that solutions of cocaine injected into and around the trunk of a nerve produced anæsthesia in the distribution of its terminal filaments.

At this stage of our knowledge of anæsthesia by cocaine, failures were frequent, for the reason that it was impossible to tell just how far the anæsthetic effect of cocaine had spread, and incisions were frequently carried into non-anæsthetized tissue, greatly to the discomfort of both patient and surgeon. The latter, as a result of a few experiences of this sort, was often led to give up local anæsthesia and pronounce it a failure; and so great was the prejudice against it that many surgeons even now hold that cocaine and other local anæsthetics give at best uncertain results, that operations under them are never perfectly painless, and general anæsthesia is to be preferred in almost all cases.

But those who were not discouraged by their early failures in local anæsthesia went on perfecting the technique,—Landerer in Germany, Reclus in France, and Halsted in this country being notable examples. It was discovered that weaker solutions of cocaine gave as good results as the stronger, if properly injected, and that the employment of one- and two-per-cent. solutions allowed the performance of more extensive operations without the danger of poisoning. It was observed, as the solutions were injected in larger amounts, that the tissue was saturated, distended, rendered œdematous by the fluid, absolute insensibility to pain was produced, and cutting, scraping, or other manipulations could be performed without any untoward sensation on the patient's part.

Reclus was one of the first to show that by injecting a syringe-ful of a one-per-cent. solution into the skin, and then beginning the next injection within the area of anæsthesia produced by the first one, quite large operative fields could be rendered anæsthetic.

Recently, Schleich, of Berlin, has elaborated the technique of local anæsthesia, and shown that the injection of a solution of salt

and other drugs has an anæsthetic effect, which is dependent upon the distention or infiltration of the tissues with the solution. He is unable, however, in practical work to dispense with cocaine in his anæsthetic solution, for the reason that, although the injection of a simple salt solution produces a local anæsthetic area, the process of injection is in itself painful, unless a little cocaine—1 part in 500 or 1 part in 1000—is added to the solution. Two years ago I published the results of my experience with the use of Schleich's solutions of salt with 1 part in 500 or 1 in 1000 of cocaine and a little morphine, and stated that I had found them perfectly satisfactory in the performance of numerous minor operations, and a few major operations in which, for some reason, the employment of a general anæsthetic was contraindicated. Since that time, acting on the theory that if it was necessary to add cocaine to the salt and morphine solutions in order to prevent pain during their injection, the cocaine alone, being a more definite local anæsthetic than the salt and morphine, ought to be sufficient, I have been employing solutions of cocaine in the strength of 1 in 500 in inflamed tissues, and 1 in 1000 in extensive operations, on non-inflamed tissues, and have found the results to be just as satisfactory as when I employed the more complicated solutions of Schleich. I have, therefore, employed the 1 to 500 and 1 to 1000 solutions of cocaine as a local anæsthetic fluid for routine use in operating under local anæsthesia. Also, during the last twelve months, since the new synthetic compound eucaine has been exploited and advocated as more effective and less toxic than cocaine, I have taken opportunity to try it in a large number of minor operations, and have endeavored to carefully compare it with cocaine. I have found that in the strength of from 1 to 200 to 1 to 500 it had marked local anæsthetic properties, and that it produced anæsthesia which was as complete and about as long continued as that of my cocaine solutions. I have found, however, that in inflamed tissues eucaine solutions are more apt to cause pain during the injection than is the case with cocaine solutions, and that in operations in vascular regions, such as the face, the fact that it causes dilatation of the blood-vessels is a decided disadvantage. As is well known, infiltration with cocaine solutions causes constriction of the smaller blood-vessels, so that during a small operation on the face the surgeon is often not at all hampered by capillary oozing, at least during the first part of the dissection, when he is making his incision or getting down to the capsule of a tumor. When eucaine is employed, the furious bleeding which ensues seriously hampers the surgeon.

I have employed a eucaine solution in the removal of a fatty tumor the size of the fist with perfect success in every respect, except that the hemorrhage was, I think, somewhat more violent than it would have been if cocaine had been employed. For injection into the bladder for the purpose of using the cystoscope, I think I should prefer eucaine, as large amounts of a strong cocaine solution, which, under these conditions are required, are apt to be absorbed by the mucous membranes, and cocaine-poisoning might result. I have never had any toxic effects from the use of cocaine in the weak solutions in which I have employed it for infiltration. I see no reason for discarding it in favor of eucaine, and have, therefore, continued to employ it as a routine anæsthetic. Eucaine is somewhat less expensive than cocaine, and it is claimed that solutions of it can be boiled without decomposing, which is not true of cocaine.

Whether cocaine or eucaine were employed, I have found that my success in securing anæsthesia depended entirely on the careful carrying out of a certain technique. Careless technique always results in pain to the patient and reproach to the surgeon. There are certain operations, and some even of a minor character, in which considerable practice has not enabled me to attain sufficient skill in the technique to avoid causing pain, and in these, therefore, unless contraindicated for some special reason, I should advise the employment of a general anæsthetic. The one essential point in local anæsthesia by cocaine or any other solution, and this was well emphasized by Schleich, is the complete infiltration of the tissues with the anæsthetic fluid. A condition of artificial œdema must be produced, so that the sensitive nerve-filaments are thoroughly surrounded by and saturated with the fluid. In proportion as it is possible to produce this condition practically, will we be successful in our results. The fluid must precede the needle, and the needle the knife, and if we never cut or push our needle or other instrument beyond the territory which has been saturated with the anæsthetic fluid, we can operate without pain to our patient. The method is as follows: the skin being, if loose, pinched up between the thumb and forefinger of the left hand, or, if tense, depressed by pressing down obliquely upon it with the needle-point, the point of the needle is slowly introduced, with the opening, which is cut obliquely, it will be remembered, downward until it is partly through the outer layer of the skin. Then a few drops of the solution is forced in, the posterior part of the opening being closed by pressing the needle downward upon the skin. A few drops having been injected, the needle-point is entirely

introduced into, but not through, the skin, and a syringe of fluid injected, making a raised white wheal, looking like a mosquito-bite. Over this wheal it will be found that the skin is perfectly anæsthetic. Then the needle is withdrawn and introduced within, but near the edge of, the anæsthetic area, and more fluid injected, extending the anæsthetic area in the required direction until sufficient skin area has been covered. If it is desired to remove a wen or small subcutaneous tumor, a circle of these wheals is made around it, and then the needle is pushed under the tumor and the tissues beneath it infiltrated. This process, if properly performed, has caused the patient no pain, or, at most, only a slight pain at the first introduction of the needle. Then the tumor may be dissected out, the knife cuts never extending beyond the area rendered œdematous, without the slightest pain to the patient. In deeper operations, requiring the division of muscle, fascia, and periosteum, after the infiltration of the skin and subcutaneous tissue, these may be cut through, and the fascia and periosteum infiltrated under the guidance of the eye, and then operated upon strictly within the anæsthetized area. In certain conditions this technique is easy, and in others difficult or impossible to carry out, and there are, therefore, certain cases in which we can operate without ether or chloroform and without pain, and others in which we cannot.

Experience with a large number of cases enables one to properly choose those adapted to local anæsthesia, and save his patients the discomfort and danger of general anæsthesia in many operations of minor surgery. It also enables him to avoid the discomfiture which results from promising to operate without pain in cases in which he is unable to carry out his project, and either has to hurt his patient badly or, after the delay caused by an unsuccessful attempt, to have recourse to general anæsthesia.

Any transgression beyond the anæsthetized area will cause pain to the patient, and in operating in inflamed tissues the pulling upon the inflamed area by retractors and the like, even if they be in contact only with anæsthetized tissues, will cause pain and difficulty.

In general, the deeper and more complicated the dissection, the more difficult and irksome will be the carrying out of a satisfactory technique. In some cases, where large nerve-trunks have to be cut across, I have found the infiltration difficult to carry out.

Schleich recommends the anæsthetization of nerves by the application of a drop of strong carbolic acid to their divided ends, but such a procedure certainly does not mitigate the pain of their divi-

sion, which is severe, and I have found sometimes that I came upon non-anæsthetized nerves in areas which were otherwise satisfactorily infiltrated, and that their section caused so much pain that I wished that I had operated under general anæsthesia. The reason for the failure of infiltration to reach the larger nerve-trunks, I think, is undoubtedly the fact that the filaments contained in them are so protected by their sheaths that the fluid does not reach them unless the needle has been actually introduced into the sheath, a procedure which we cannot perform with accuracy unless the nerve is freely exposed in the dissection, and which even then is apt to be attended with pain. Operations upon the median line of the body are especially adapted to deep dissections under local anæsthesia, for the reason that no large nerve-fibres are met with, and we have to do only with the terminal filaments which meet in the middle line.

This applies to such operations as median laparotomy, perineorrhaphy, and the like. Such operations, as will be explained more in detail below, I would not advocate performing in general under local anæsthesia; but in special cases and emergencies, when a general anæsthetic is inadvisable, they may be performed with considerable facility and freedom from pain under local anæsthesia.

A brief classification of operations, according to the facility with which they may be performed under local anæsthesia, with remarks explanatory of the reasons, will perhaps enable us to appreciate the limits of the applicability of local anæsthesia better than any other method. In Class 1 I would place those operations in which local anæsthesia gives in general perfectly satisfactory results, and in which I would rarely employ a general anæsthetic except for special reasons, such as idiosyncrasy of the patient or the desire on the part of the patient not to be conscious that he is being operated upon. Such operations are the removal of subcutaneous tumors in non-inflamed tissue, particularly in the scalp, face, back of the neck, or median line of the body. Epitheliomata, either upon the face or anywhere upon the body, may be easily and satisfactorily removed under local anæsthesia. Large tumors of this character may often be satisfactorily removed. The skin of the back, particularly near the median line, is very easy to render anæsthetic, as it is sparsely provided with sensitive nerve-filaments. Small circumscribed abscesses, especially those formed by the breaking down of tubercular glands, which are so thoroughly softened as not to require extensive curetting, may be opened and drained under cocaine absolutely without pain.

The removal of foreign bodies from the extremities, such as needles in the hand, and operations for ingrowing toe-nail, can be performed under cocaine with perfect ease, and for these I rarely employ general anæsthesia. Felons of the fingers may be done under cocaine if the inflammation has not extended beyond the second joint, so that the infiltration can be begun in healthy tissue. All the tissues of the fingers and toes may be infiltrated, including skin, subcutaneous tissue, tendons, and periosteum, so that the bone may be amputated without pain. Where bone operations are to be performed, it is frequently wiser to employ a general anæsthetic, as the crunching of bone-forceps and sawing of bone is disagreeable to many patients, even though unattended with pain.

In the removal of pieces of tumors for diagnoses, local anæsthesia has an important place. In general, with regard to operating upon the skin and subcutaneous tissues, it will be found that where the skin and underlying tissues are soft and not stiffened by callous or tough fascia, infiltration is easy. This is true of the skin over nearly the whole of the body.

In the palms of the hands and soles of the feet, the toughness of the skin and its adhesion to the strong underlying fascia render infiltration difficult, owing to the force required to send the fluid into the tissues, and also the impossibility of judging just how far it has gone.

In Class 2 I would place a class of cases in which local anæsthesia, although not giving ideal results, is often of advantage. Here comes moderately extensive abscesses, where curetting is not required. Such abscesses may be infiltrated and incised absolutely without pain; but the dilatation of the wound and insertion of the drainage-tube are painful, owing to the stretching of the inflamed tissues beyond the anæsthetized area.

In Class 3, operations in which local anæsthesia should not in general be employed, I should place operations upon extensive inflammatory processes, which it is impossible to infiltrate and operate upon without pain, as the tissues are already so distended with the serum as the result of inflammation that further infiltration is impossible. The cocaine cannot be driven in without first driving out the serum from the already distended lymph-space, a process which will often be attended with as much pain as operations without anæsthesia.

In general, the only operations which can be performed with perfect local anæsthesia on inflamed tissues are those in which it is possible to surround the inflamed area by an infiltration in healthy

tissues cutting off its nerve-supply. Extensive dissections of the inguinal glands for adenitis have been reported by Bransford Lewis and other authors, as performed under local anæsthesia; but in my own experience, no matter how careful the technique, I have found local anæsthesia unsatisfactory in these cases. In this class of operations, which should not be attempted under local anæsthesia,—that is, in the majority of instances,—should be placed major operations in general, and those which require consultation during the operation between the operator and his assistants or consultants, a participation in which might be demoralizing to the patient. Operations involving exposure and disagreeable manipulations about the genitals or rectum are usually, in sensitive persons, best performed under general anæsthesia. In deep dissections around important blood-vessels and nerves it is usually advisable to employ a general anæsthesia.

As to abdominal operations, the necessity for muscular relaxation, and the extent and formidable nature of the manipulation required, render them unsuitable for local anæsthesia. In operations for rupture of adhesions about ankylosed joints and other procedures requiring stretching and straining of adhesions, local anæsthesia is of no benefit. In delicate plastic operations, such as those about the eyelids, the infiltration anæsthesia so distorts the flaps as to increase the difficulties of the operation, and therefore it is a rule better to resort to a general anæsthetic.

In the above list of operations in which local anæsthesia is not in general advised are included so large a number of the major operations of surgery, that we may well inquire whether local anæsthesia has any field among operations of a more formidable character. The answer is, that in certain cases of a major character, some of these among the more important surgical emergencies, local anæsthesia has proved of the greatest value.

These are operations which we often have to perform under a vital indication, and in which the employment of a general anæsthetic adds greatly to the danger of losing the patient. In these cases we can often save our patient a vast amount of suffering by the use of local anæsthesia.

The operation of tracheotomy, where required for stenosis of the larynx, may be easily and painlessly performed under cocaine, and the obvious dangers of a general anæsthetic avoided. The dangers of general anæsthesia in operations for neglected strangulated hernia in patients the subjects of chronic bronchitis are well known. The operation for the relief of strangulated hernia may be easily and sat-

isfactorily performed under local anæsthesia. I was recently called upon to operate upon a recently strangulated femoral hernia as large as a foetal head at term in a woman of sixty years with a weak heart, beating at the rate of 160, who also had a chronic bronchitis. Under local anæsthesia I was able with ease not only to open the sac, incise the constricting ring, reduce the two and a half feet of distended intestine, with the cæcum and appendix, which were contained in the hernia, but to suture the ring, so that I hope a radical cure has been effected. The operation was performed two weeks ago, and the woman's recovery has been uneventful. I felt that general anæsthesia would have added very greatly to the danger of this operation, which was performed with so little pain to the patient that she thanked me at the close of the proceeding for hurting her so little. Intestines can be handled or even incised without pain even without an anæsthetic. I have anæsthetized the abdomen of an old man, the state of whose kidneys would not allow of general anæsthesia, for Dr. H. W. Cushing, who performed a suprapubic cystotomy, and have seen Dr. Gerster perform a gastrotomy for cancer of the œsophagus under cocaine in a patient too weak for general anæsthesia, and immediately feed the patient through the opening before he left the operating-table.

The chest may be drained under local anæsthesia in empyema, in cases where the pressure of the fluid on the heart made general anæsthesia inadvisable.

In view of these facts, although local anæsthesia is not in general advisable for major operations, there is a certain class in which it is not only advisable, but demanded, and its employment in preference to a general anæsthetic may save the patient's life.

One word with regard to the employment of local anæsthesia in neurasthenic patients. There is a certain class of patients, mostly neurotic women, who desire not only not to feel the pain of the knife, but have such a horror of surgery that the mere knowledge that they are being cut, even though the cutting be painless, will cause them to struggle, protest, and make outcry. After making a tremendous outcry and greatly disconcerting the surgeon, these patients will often tell him that they felt no pain, but the consciousness that they were being operated upon, and the fear that they would be hurt, were so dreadful that they wished they had taken ether. In patients of this sort it is wise to employ a general anæsthetic.

SYPHILITIC AFFECTIONS OF THE MOUTH.¹

BY HENRY H. BURCHARD, M.D., D.D.S.

THE recognition of syphilitic lesions about the mouth is of vital importance to the dental operator, first, because by their recognition he may take steps to prevent the carriage of infection to innocent patients, and, secondly, that he may avoid inoculation of himself by the poison.

Syphilis is associated in the minds of many with the lower classes of persons who are confirmed debauchees; while it is undoubtedly true that its prevalence is most marked in this class of persons, it appears, and with horrible frequency, in individuals who would be little suspected of having such infection. The operator is to be guided in his opinions and precautions in this matter not by the social status of the patient but by the nature of the morbid conditions existing.

The disease syphilis is usually divided into three stages: primary, secondary, and tertiary. To these might be added a fourth stage, —viz., in patients who have been discharged as cured. Mild manifestations of disorders, particularly of the skin and mucous membrane, make their appearance from time to time, and disappear promptly upon the administration of iodides.

The first stage of syphilis, primary syphilis, consists in the formation of the primary sore or chancre and the involvement of the nearest lymphatic glands.

Secondary syphilis appears after the first, and is attended by fever, inflammations of the skin with eruptions, inflammation and superficial ulcerations of mucous structures.

In tertiary syphilis destructive inflammation of the skin and mucous membranes and of connective tissues occur, together with the formation of specific tumors, gummata. Some difference of opinion exists among syphilographers as to the relative infective power of the secretions from the several lesions of syphilis; all are agreed, however, that the secretions from the secondary lesions observed in and about the mouth are highly infective. It is the part of prudence to regard lesions of all stages as infective.

All three stages of syphilis may be seen in the human mouth.

¹ Excerpt from chapter on Infections in Dr. Burchard's new text-book of "Dental Pathology and Therapeutics." Lea Brothers & Co., 1898. (In press.) Read before the Academy of Stomatology, December 28, 1897.

It is to be remembered that if the mucous membrane of the mouth be infected from a mucous patch, which is a secondary lesion, the acquired disease appears not as a mucous patch but as a chancre. It is from mucous patches that infection is most to be feared in dental practice.

PRIMARY SYPHILIS OF THE MOUTH.

The primary lesion of syphilis, chancre, is found in the mouth in consequence of direct infection, carried from a syphilitic. The infection may occur from contact of the mucous surface of the mouth with a syphilitic lesion upon another person. It has been transmitted by kissing. It may occur from using a glass or cup previously used by a syphilitic, by smoking cigars or cigarettes which have been made by syphilitic cigar-makers who have applied the tongue to the tobacco in attaching the wrapper.

Any of the articles named or the contact of any article which has been in contact with a syphilitic lesion, if brought in contact with an abraded mucous surface, is very likely to cause infection. The infection may be transferred from patient to operator if the fingers have any abraded surface, or if the surface is broken accidentally by an instrument. Infection may be transmitted from one patient to another by any instrument, appliance, or article used by the syphilitic being afterwards used by an innocent person. Drinking-glasses, mouth-mirrors, exploring instruments, rubber dam, rubber-dam clamps, lancets, forceps, or any other instruments, may be the medium of communication. During and since the time of Hunter, the use of teeth from syphilitic patients in plantation operations has been a clearly recognized medium of communication.

"The primary lesion of syphilis never makes its appearance before ten days after infection; the maximum period is about ninety days, the average is twenty-one days." (Gross.)

It usually appears as a single elevated papule; in cases of dental infection frequently about the lips; the papule loses its epithelial coating after some days. The hardening surrounding the papular mass increases until the papule, which is now raw and in a process of ulceration, appears surrounded by a ring of cartilaginous hardness. This induration is the one distinguishing feature of the chancre, which is not painful. In about a week after the appearance of the primary sore swelling of the submaxillary lymphatic glands is observed. "In case the chancre appears upon the tongue, the subhyoid lymphatic glands are swollen" (Park). Unless pyogenic infection has occurred, the lymphatic involvement is not inflammatory, there being no pain in the glands.

In from three to four weeks the sore disappears; in some cases leaving no sign of its site, in others some induration may persist.

The diagnosis of this condition is the important consideration so far as the dental practitioner is concerned, its constitutional treatment being the office of the general surgeon.

The elevation of the sore, its induration, and, if obtainable, the date of inoculation are diagnostic data. The sore is single, and there is hard, nodular, painless swelling of the neighboring lymphatics. A single ulcer of ulcerative stomatitis may in some degree simulate the appearance of chancre, for it may exhibit slight induration. Their irregular form, situation, painfulness, and usual absence of lymphatic involvement, together with their prompt disappearance after sterilizing the mouth and cauterizing of the ulcer, will differentiate the two sores.

It is a wise precaution, however, to view all sores about the mouth as possibly infective; all errors of diagnosis in this direction will be more than compensated for by the assurance of non-transference of infection.

SECONDARY SYPHILIS OF THE MOUTH.

The secondary manifestations of syphilis are observed in and about the mouth, no matter where the location of the primary lesion may have been; they are the result of a general, not a local, infection.

Secondary affections of the mucous tissues appear in from four to twelve weeks after the appearance of the primary lesion. Sore throat due to inflammation of the mucous membrane of the pharynx and parts about is almost constant, together with syphilitic hoarseness due to the extension of the affection to the mucous membrane of the larynx. Symmetrical and usually painless, shallow ulcers of the tonsils are characteristic. The appearance of copper-colored areas upon some portion of the mucous membrane, on the tonsil, pharynx, soft palate, lips, or bucco-labial surface, precedes the loss of epithelium over such surfaces, which soon occurs, forming the most virulently contagious lesion of syphilis, the mucous patch.

These become covered with a grayish-white pasty coating resembling the ulcerations of non-specific stomatitis; so close is the resemblance that a differentiation can only be made at times by additional evidences of secondary syphilis. Single patches may coalesce, forming large, irregular areas covered by a grayish-white pellicle. These patches are rarely painful. Ulcerations having ragged, irregular outlines may appear at the sites of the original

patches or in other situations which exhibit a tendency to spread. The diagnosis of the condition is determined by a discovery of other lesions of secondary syphilis, skin-eruptions, falling out of the hair (alopecia), and by the areas of copper-colored eruption upon the mucous membrane of the pharynx and soft palate. Hügenschmidt has found the frequent nocturnal occurrence of indefinitely located dental pains spreading to the palatal region in the absence of local lesions.

TERTIARY SYPHILIS OF THE MOUTH.

The syphilides of the secondary stage arise in and are confined to the mucous and submucous structures of the mouth; those of the tertiary stage arise in the deep connective tissues, and are frequently associated with periosteum.

Tertiary lesions as seen by the dentists are usually in the form of ulcers, of first the soft or hard palate of the tongue or lips. In the earlier stages hard, nodular formations may be noted as antecedents to the ulcerations. Chronic periostitis of the palatal process may occur, leading to the formation of localized thickenings. In other cases localized swellings in the soft palate may occur; the overlying mucous membrane breaks, establishing an ulcer, which may perforate the soft palate, destroy a portion of the palatal process, or form large ulcers on the tongue. These lesions appear in from two to five years after the secondary manifestations. Although there is much doubt as to the infectiveness of these tertiary lesions, precautions as to sterilization should be taken as with the primary and secondary lesions.

A defined ragged ulcer occupying the hard or soft palate, which has persisted for a long time, is always viewed with suspicion, and a search is made for other evidences of syphilis. These ulcerations appearing upon the side of the tongue may closely simulate epithelioma of that organ; the confusion is increased if in consequence of the presence of jagged teeth a continuous irritation is excited. Moreover, leukoplakia of the cheeks frequently accompanies tertiary syphilis. An absolute diagnosis is only made out in some cases by noting the disappearance of the local lesion upon the administration of iodides, the specific treatment of tertiary syphilis.

In any of these conditions, particularly those named under the head of secondary affections, extraordinary precautions should be taken to prevent transmission of infection. Every instrument or article brought in contact with the mouth of the patient should be set aside for special sterilization. Napkins used upon such patients

should be thrown away; the same applies, of course, to rubber dam and saliva tube ejectors. All other articles should be immersed in an antiseptic solution, say a five-per-cent. lysol solution, and be afterwards boiled for fifteen minutes in a two-per-cent. solution of sodium carbonate, not bicarbonate.

Forceps, rubber-dam clamps, and mouth-mirrors need special attention. Should the fingers of the operator have any abrasions upon them, it is the part of prudence not to insert them in the syphilitic mouth, certainly never without first covering the abrasions with collodion or an impenetrable varnish.

The above excerpt is as much material relative to this subject as the plan of the text-book from which it is taken admits. This might be expanded to any length, however. The principal object in presenting this matter, with the illustrations, is to point out the more usual oral manifestations of syphilis, their relative infectiousness, and their diagnosis.

The picture of the chancre represents an outlined sore upon the lower lip; similar sores may be seen upon the gums, the tongue, the pharynx, and other parts. If on the tongue, they may be very large instead of small, as here represented; the mechanical irritation of bruising against irregular teeth, or their sharp edges, may cause very angry-looking and extensive sores.

This applies also to the secondary sore which is depicted under similar conditions, and particularly in the mouths of confirmed smokers, where secondary lesions are most extensive. Under these conditions the lesions of secondary syphilis may acquire the appearance of tertiary lesions. This is of decided importance, because it is the lesions of secondary syphilis which are the highly infective ones, even more, the saliva is probably infective, whereas it is doubtful whether tertiary lesions are infective.

The gumma in the palate is represented in the submucous tissue prior to discharge and ulceration. The phagedenic nature of these tertiary sores is shown in the lesion of the lower lip where the deep muscles of the lip are invaded.

I show you also representations of Hutchinson's teeth, diagnostic signs of hereditary syphilis. You will observe that the malformation is confined to the upper central incisors; this is a general but by no means universal truth, for the malformation may involve the other teeth also; this, however, is unusual. Williams has shown that the dentine of such teeth is very badly organized, as is also the enamel; but the formative organ of the

latter tissue is disordered in function and form; not only is the enamel built with great irregularity as to its elements, but the functional activity of the ameloblasts ceases too soon. The teeth formed during the eruptive fevers are shown in contrast; it will be seen in these, that while the teeth have almost their normal forms, enamel-building has been checked at an early period, affecting all of the developing tooth, but when the nutritive equilibrium is re-established enamel deposit proceeds normally.

Abstracts and Translations.

DENTISTRY IN FOREIGN COUNTRIES.

APPLICATION having been made to the Department of State for information as to the conditions governing the practice of dentistry in the various countries of Europe, and in the Hawaiian Islands especially, and the qualifications necessary for an American dentist, the diplomatic officers at the European capitals and the minister at Honolulu were requested to obtain the desired data. Their answers, in substance, are printed here for the general information of the dental profession of the United States. A note from the Mexican minister at Washington, in response to an inquiry from another source, as to the conditions in Mexico, is included in the series.

AUSTRIA-HUNGARY.—Replying to despatch of June 30 last, asking for information in regard to foreign dentists practising their profession in this country, I beg to reply that foreign dentists are practically excluded from practising in Austria; the same general law which governs the practice of medicine applies to dentistry. Every medical doctor or dentist must have passed the regular examinations of the various Austrian state preparatory schools, university, and medical colleges; no foreign diplomas of any kind are accepted as evidence of fitness in either profession. By this law any regular graduate of medicine may, if he prefers, practise dentistry without any further examination in that special branch of the profession. So far as I am able to learn, there is only one so-called American dentist practising his profession in this country, and he received a special permit to do so from the emperor, after having renounced his American citizenship and become a natural-

ized citizen of Austria. This special imperial permission allowed him to employ two assistants, without regard to their nationality.

LAWRENCE TOWNSEND,
Secretary of Legation.

VIENNA, July 29, 1896.

BELGIUM.—Foreign dentists are admitted to practise their profession in Belgium, provided they comply with the conditions prescribed in a royal decree of January 6, 1885.

All candidates, foreign or native, are required to pass an examination prescribed by the medical commission of the province in which they have resided during the two years that all such candidates must practise in the office of a regularly licensed dentist. This examination is announced in the *Moniteur Belge* a month before it is held. All candidates presenting themselves for this examination must be provided with a certificate showing that they have performed the preliminary two years' practice above mentioned. However, the Minister of the Interior and of Public Instruction may excuse from the production of this certificate any foreign candidate who has acquired the right to practise his profession in his own country.

JAS. S. EWING,
Minister.

BRUSSELS, August 25, 1896.

DENMARK.—I have met with much difficulty in obtaining the information desired as to practice of dentistry in Denmark by foreigners, for the reason that the ordinances and regulations are contained in several pamphlets, which are out of print and not on sale. But at length I have found copies and obtained leave to have them translated.

The general result is that dentists cannot practise in Denmark without a license, and such license cannot be obtained without passing an examination and a certain amount of service as assistant; and the applicant is not entitled to such examination without certain educational certificates and proofs of good character.

JOHN E. RISLEY,
Minister.

COPENHAGEN, September 11, 1896.

FRANCE.—In reply to department instruction of June 30, asking under what conditions foreign dentists are admitted to practise their profession in France, and whether the conditions prescribe an examination or not, I have the honor to furnish the following information:

According to Article 2 of the law of November 30, 1892, no one can exercise the profession of dentist in France if he is not provided with a French diploma of doctor of medicine or of surgeon dentist, issued by a superior medical institution of the state, after a certain course of studies fixed by the government and followed by public examination.

HENRY VIGNAUD,

Secretary of Embassy.

PARIS, July 16, 1896.

GERMANY.—On the receipt of the instruction of June 30 last, I addressed a note to the imperial foreign office, requesting, as directed, to be furnished with information as to the conditions under which foreign dentists are admitted to practise their profession in Germany. A reply to this note has now been received, and I have the honor to transmit herewith a copy, with translation, of the same.

EDWIN F. UHL,

Ambassador.

BERLIN, October 2, 1896.

[Translation.]

FOREIGN OFFICE, BERLIN, October 1, 1896.

Referring to the communication of July 18 last (F. O., No. 69), the undersigned has the honor to inform his excellency the ambassador extraordinary and plenipotentiary of the United States of America, Mr. Edwin F. Uhl, that no official permit is necessary for practising dentistry in Germany. Those persons, however, who wish to use the title of "doctor of dentistry," or another title of equal value, require, according to section 29 of the trade regulation (as adopted July 1, 1883, imperial law sheet, p. 177*f*), a permit (approbation), which, with certain exceptions prescribed by the chancellor of the (North German) union in his proclamation of December 9, 1869 (law sheet, p. 687), can only be granted after passing an examination according to the regulations contained in the publication of the imperial chancellor of July 5, 1889 (central sheet for the German empire, p. 417).

The regulations referred to, as well as another publication referring to this subject (central sheet for the German empire, 1890, p. 81), are herewith inclosed.

HOLSTEIN.

GREECE.—In accordance with the instruction of the 30th ultimo, I have the honor to inclose herewith a statement of the conditions under which foreign dentists are admitted to practice in Greece. As soon as possible, I shall forward the regulations on the subject in force in Roumania and Servia.

All persons desiring to obtain permission to practise dentistry in Greece must submit an official certificate from a recognized dental school or from a recognized dentist, certifying that they have been instructed and are proficient in dentistry.

Their examination shall be conducted either in the Greek language or in a foreign language. The subjects of examination are: (1) anatomy of the mouth and of the jaw-bones, (2) physiology of the teeth, (3) pathology and therapeutics of the teeth, (4) operations on the teeth, and (5) mechanical dentistry. The examination fee is twenty drachmas (about two dollars and thirty cents), and the fee for a certificate of permission to practise is ten drachmas (about one dollar and fifteen cents).

Foreign diplomas are authenticated on payment of four hundred drachmas (about forty-six dollars) for the stamped paper required. Without previous authentication of their diplomas, applicants from foreign countries are not allowed to present themselves for examination. It will be seen from the foregoing that all applicants, whether Greeks or foreigners, are required to pass an examination before permission to practise is granted, the only distinction made between Greeks and foreigners being that the diplomas of foreigners must first be verified.

E. ALEXANDER,

Minister.

ATHENS, July 23, 1896.

HAWAIIAN ISLANDS.—In reply to the instruction of June 30, relative to the conditions under which foreign dentists are permitted to practise their profession in the Hawaiian Islands, I have the honor to inclose herewith a copy of chapter 72 of the session laws of 1892, which will furnish the desired information.

ELLIS MILLS,

Chargé d'Affaires ad interim.

HONOLULU, August 6, 1896.

Sections 1, 6, and 7 are alone given.

SECTION 1. From and after the passage of this act it shall be unlawful for any person or persons to practise dentistry in the Hawaiian kingdom except upon a certificate issued from a board of dental directors.

SEC. 6. From and after sixty days subsequent to the passage of this act, the said board shall issue a certificate of qualification to any person who shall present a diploma from a reputable dental college or who shall pass a creditable examination before the board.

SEC. 7. Any person or persons receiving certificates from said board shall present said certificates to the Minister of the Interior, who shall record the same in a book kept for such purpose.

ITALY.—I have the honor to refer to the department instruction of June 30 last, on the subject of the admission to practice in Italy of foreign dentists, and to inclose accordingly herewith the copy

and translation of a note which has been received to-day from the foreign office in reply to inquiries in the matter, together with the pamphlet referred to therein.

I beg to add that as there is no regular school of dentistry in Italy, some little informality in practice has existed, at least locally in Rome, in permitting foreigners to follow their profession, and on presentation before the proper officials of satisfactory credentials the applicants have been told they might practise among the people of their own nationality. But lately there has been begun an agitation against the granting of even that limited privilege and for the strict enforcement of the laws, information concerning which is contained in the before mentioned note from the foreign office.

LARZ ANDERSON,
Secretary of Embassy.

ROME, August 4, 1896.

[Translation.]

MINISTRY OF FOREIGN AFFAIRS, August 3, 1896.

In consideration of this, foreign dentists, too, in order to practise in Italy, must be furnished with the diploma for physic and surgery, and, according to Article 33 of the above-mentioned law, must have complied with the provision of Article 140 of the law of the 18th of November, 1859, with regard to public education, and which reads as follows:

"Examinations passed and degrees obtained outside the kingdom will have no effect in the state, except by some special law. Nevertheless, those who shall have obtained degrees in any of the Italian universities, or in some foreign university of greater importance, and shall prove to have really undergone the studies and examinations required for similar degrees in the universities of the state, will be freed from the condition of passing the special examination, and will be admitted, without further difficulty, to the general examination for the degrees which they care to take."

MEXICO.—Under date of June 3, 1896, Mr. Romero, minister from Mexico to the United States, writes to the Secretary of State:

In reply to your letter of the 1st instant, I have the honor to state that in order to practise the profession of dentistry in Mexico, it is not necessary to previously undergo an examination, it being sufficient to have the proper diploma issued by a foreign dental college, and the certificate duly authenticated by the competent authority in consideration of which that college has the legal power to issue such diplomas. Neither do the Mexican laws require the interested party to pass an examination in the Spanish language.

This has been the practice followed, but in case there may recently have been made some change of which I am ignorant, I will address the government of Mexico on this point, and, if so, I will have the honor to inform you.

NETHERLANDS.—Referring to department instruction, dated June 30, 1896, relating to dentistry in the Netherlands, I have the honor to inclose herewith a copy of the laws of December 25, 1878, and of March 26, 1895, relating to the subject.

Articles 8 and 9 of the first-mentioned law, a translation of which is annexed, prescribe the examinations to which persons desiring to practise as dentists in the Netherlands shall submit, and Articles 3 and 5 of the latter law, a translation of which is also attached, specify the foreign certificates or diplomas which permit a candidate to appear before the Netherlands examining committee for examination. The foreign certificates or diplomas thus recognized are the Belgian, German, British, French, Austrian, and Swiss medical diplomas, and the Belgian, German, British, French, and Swiss dental diplomas, in addition to those issued in the Dutch Indies, Surinam, and Curaçoa.

WILLIAM E. QUINBY,
Minister.

THE HAGUE, September 2, 1896.

PORTUGAL.—I have the honor to acknowledge the receipt of instruction dated June 30 last, addressed to Mr. Wilbor, in charge, and in reply have to state that an examination in the Portuguese language before the lyceum is imperative for all persons who desire to practise medicine or surgery in any of its branches in the kingdom.

This examination is duly certified to. The candidate is closely examined before the school of medicine, in the Portuguese language; in the case of dentists, in the anatomy of the head. Both of these examinations are rigorous. Once successfully passed, the candidate, upon the payment of about sixty dollars, is entitled to practise.

I inclose herein a digest of the medical law of July 13, 1870, still in force, bearing upon this subject.

GEO. WM. CARUTH,
Minister.

LISBON, August 12, 1896.

RUSSIA.—Referring to the instruction of June 30, I have the honor to transmit herewith copy and translation of Mr. Chichkine's note of September 11-23, and his accompanying inclosure of the law and regulations relating to the practice of dentistry within the empire for Russians and foreigners.

CLIFTON R. BRECKINRIDGE,
Minister.

ST. PETERSBURG, September 25, 1896.

[Translation of Mr. Chichkine's note.]

IMPERIAL MINISTRY OF FOREIGN AFFAIRS,
DEPARTMENT OF INTERIOR RELATIONS,
ST. PETERSBURG, September 11-23, 1896.

MR. MINISTER,—In reply to the note of June 29 (July 1) last, I have the honor to transmit herewith an extract of the laws of the empire containing the necessary prescriptions for Russian or foreign dentists who desire to acquire the right to practise in Russia.

I avail myself, etc.,

CHICHKINE.

MR. CLIFTON R. BRECKINRIDGE, ETC.

[Translation.]

ARTICLE 93. No person, either Russian or foreign, who does not possess a diploma or certificate from the universities and Military Medical Academy is allowed to practise any branch of medicine or to practise as a veterinary in Russia.

Supplement to Article 596, Section Third.—(Section 32.) Persons desiring the title of surgical dentist must have finished with success the studies at the medical-dentistry school and must undergo an examination by the examining committee of the university or Military Medical Academy.

Section 31. Persons desiring the title of dentist must present (1) a certificate, attested to by the local medical board, to the effect that the petitioners have studied dentistry for a period of three years with some well-known dentist, and that they have performed various dental operations on living beings with the proper skill and knowledge; (2) they must undergo an examination on the formation of the human skull, teeth, and gums, on the diseases the same are liable to, and on the means of curing by local means, being such as dentists are authorized to employ; (3) they must also undergo practical examinations at the hospitals, and perform several dental operations on dead bodies and living beings.

SPAIN.—Under date of September 28, 1896, the Spanish minister at Washington replies to an inquiry from the Department of State as follows:

In reply to your esteemed favor of the 26th of June, inquiring under what conditions American dentists are admitted to practice their profession in Spain, I take pleasure in inclosing a copy of the decree regulating the matter, which was recently forwarded to me from the proper department at Madrid.

You will no doubt notice that the contents of said decree refer chiefly to the medical profession, but dentists are admitted to practice under the same conditions as medical doctors.

The decree in question, dated February 6, 1869, provides that foreigners may enter the universities and other educational institutions of Spain on the same terms with Spaniards upon submitting to the rules in force. Persons who may have obtained academical degrees abroad may be admitted to the same examinations as those

to which Spaniards are subjected, provided the authenticity of the degrees is established. The fees are the same as those paid by Spaniards. After having received a Spanish degree, foreign physicians must submit to the regulations decreed for Spanish physicians. Article 6 says, "To practise the medical profession, it shall suffice to present the degree acquired in a foreign public institution and to pay two hundred escudos on obtaining the authorization, which shall be given on receipt of the certified degrees." Article 8 provides that the foreign degree must be one that is recognized as valid in Spain. Application must be made on stamped paper, addressed to His Excellency the Minister of Public Works, accompanied by the original degree and a translation of it into Spanish made by the interpreter at the Department of Foreign Affairs.

SWEDEN.—The surgeon-general informs me that Swedish citizenship is required for every one wishing to practise a profession in Sweden, but there is nothing to prevent surgeon dentists wishing to practise under the rules imposed upon Swedish dentists, addressing a supplication to the king, stating their intention of becoming Swedish citizens. Applications must always be accompanied by certificates, and the applicants must pass the regular examination.

The surgeon-general informs me that there have been many such applications presented, but he could not recall a single instance of permission having been granted.

There has been, as yet, no compilation of the laws relating to dentistry in Norway, but I understand that one is in the course of preparation, and if I can secure a copy will forward it later.

T. B. FERGUSON,

Minister.

STOCKHOLM, October 1, 1896.

SWITZERLAND.—I have the honor to acknowledge the receipt of the instruction of June 30, 1896, asking under what conditions foreign dentists are admitted to practise their profession in Switzerland, and whether these conditions require an examination or not. In answer to this inquiry, I have the honor to inclose herewith a copy, in the German language, of a paragraph of a communication recently received at this legation from Professor Dr. Courvoisier, president of the Federal Medical Commission of Switzerland. I also transmit to the department by separate mail five small pamphlets of printed matter,—one in German, the others in the French language,—which, I am advised, embrace all the regulations now in force in Switzerland applicable to the practice of dentistry by for-

eigners. From these and other sources I understand (1) that no foreign diploma is recognized in Switzerland; (2) that all foreigners desiring to practise dentistry must submit to a thorough practical examination and to the maturit ts examination; (3) that all examinations must be conducted in the French, German, or Italian language.

The practical effect of these regulations is the exclusion of all, or nearly all, American dentists, as a residence of several years in Switzerland, or a regular course in one of their universities, would be necessary to qualify them to successfully pass an examination. In answer to the remonstrance raised by American dentists here against these regulations, the response is made that identically the same requirements are exacted of native practitioners.

JOHN L. PEAK,
Minister.

BERNE, August 6, 1896.

UNITED KINGDOM.—Referring to the instruction of the 30th of June last, in relation to the conditions under which foreign dentists are admitted to practice in Great Britain, I have the honor to inclose herewith a copy of a note addressed by Mr. Bayard to Lord Salisbury on the 15th ultimo, together with a copy of his lordship's reply of the 1st instant on this subject.

JAMES R. ROOSEVELT,
Secretary of Embassy.

LONDON, August 5, 1896.

MR. BAYARD TO THE MARQUIS OF SALISBURY.

EMBASSY OF THE UNITED STATES,
LONDON, July 15, 1896.

MY LORD,—Referring to your lordship's note of the 23d of July, 1889, relating to the condition under which foreign dentists are admitted to practice in the United Kingdom, I have the honor to inform your lordship that I am instructed by my government to ask whether the regulations referred to prescribe an examination or not, and if they have been in any way changed or added to since the date of the above-mentioned note.

I shall also be extremely obliged to your lordship if additional copies of all laws and regulations upon the subject can be kindly furnished me, for the use of my government.

I have, etc.,
T. F. BAYARD.

The Most Honorable The MARQUIS OF SALISBURY, K.G., etc.

LORD SALISBURY TO MR. BAYARD.

FOREIGN OFFICE, August 1, 1896.

SIR,—With reference to Mr. Bayard's note of the 15th ultimo, making further inquiries as to the conditions under which foreign dentists are admitted

to practice in the United Kingdom, I have the honor to state that the lord president of the council has been informed by the president of the General Medical Council, to whom the matter, being of a technical nature, was referred, that the provisions of sections 8, 9, and 10 of the dentists' act, 1878, which governs the registration of foreign (and colonial) dentists with recognized certificates, imposes on the General Medical Council the duty of deciding whether the certificate entitles the holder to practise dentistry in his own state (or colony), and whether such certificate furnishes "sufficient guaranty of the possession of the requisite knowledge and skill for the efficient practice of dentistry or dental surgery."

In accordance with this duty, the General Medical Council has decided to recognize only such certificates as are evidence of a course of study and examination in arts and in dental surgery not inferior to those of British dental practitioners.

As the result of an inquiry held by them in 1879 into the sufficiency of the degree granted by the various American dental licensing bodies who applied for recognition, the University of Harvard and the University of Michigan were recognized as bodies granting "qualifications" which entitled the holders to registration in the United Kingdom, and no other application was granted. But after investigation in 1893 by the education committee of the council, it was found that the curricula of these two bodies were not considered adequate to insure the possession of the necessary qualifications, and the council thereupon resolved that the recognition of the dental degrees of the two universities above mentioned should be suspended until further notice. Consequently, no foreign dental degrees are at present recognized.

I beg leave to inclose copies of the medical acts from 1858 to 1886 (including the dentists' act, 1878), of the report of the education committee referred to above, and a report of the same committee, which will show the course of study and examination required for British dentists.

I have, etc.,
SALISBURY.

Reports of Society Meetings.

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held at Young's Hotel, Wednesday evening, December 1, 1897, at six o'clock, President Cooke in the chair.

A paper was read by Dr. F. B. Lund, entitled "The Place of Local Anæsthesia in Surgery."

(For Dr. Lund's paper, see page 152.)

DISCUSSION.

Dr. Potter.—I wish that our essayist would try to use cocaine in some of the cases in which we try to use it. We go into the tough mucous membrane, and underneath that is the periosteum, and every one who has tried it knows that we get into a very hard, unyielding field of operation. Not only that, but when we get an anæsthetized area, we do not always operate there, but at a point somewhat removed, as in the extraction of teeth. Can we reach the nerve-filaments encased in their bony walls? Some of us have done it with success; but I think no one can claim that he always has success. I remember, in 1885, my first use of cocaine by hypodermic injection for the extraction of a tooth. I injected on the outer and inner side of a lower molar root, using a five-per-cent. solution, and putting in at least a minim on each side, and the operation was quite satisfactory. I have used the drug more or less ever since, and it has been my experience that in order to get a very good result in extracting a tooth I need to use a four- or five-per-cent. solution, and put in about one-tenth of a grain. I have searched the authorities very thoroughly to see what is regarded as a therapeutic dose, and I find that one-eighth of a grain is about the maximum for use in regions about the head. It seems to me that in extraction it is necessary to put in about one-tenth of a grain in order to get a satisfactory result. I have had one unfavorable case in the use of this drug, which put me on my guard. We need to have the necessity of care in its use impressed upon us. If we use the very dilute solutions which have been spoken of here to-night, we are not likely to obtain systemic effects; but in my experience the stronger solutions—four and five per cent.—are better for our purpose.

Dr. Lund.—I should like to say that I think the region around the teeth and gums would be as unsatisfactory a place to work in as could be found. In other parts of the body one can use of the 1 to 500 solution twenty-five syringe-fuls, of twenty minims each, in an extensive operation without causing the absorption of a dangerous amount, since a good deal of the injected fluid runs out when the tumors are cut and retracted. Of a 1 to 1000 solution, fifty syringe-fuls could be used without unduly increasing the amount of cocaine. In the removal of tumors, etc., where there is always more or less extensive dissection, these weak solutions are effectual and really safe. But as to getting inside of the bony channels in the mouth, I should think it would be extremely difficult and uncertain.

Dr. Piper.—Will the essayist please tell us how the tissue recovers in those cases where many injections have been made, and what condition it is in after being treated in that way?

Dr. Lund.—The fluid is gradually absorbed. It does not interfere with the healing, provided you inject an aseptic fluid. Naturally, if you inject a septic fluid, it suppurates; but if a perfectly clean solution is used, the cedema will disappear after twenty-four hours, or, at least, be displaced by a slight inflammatory swelling without redness, which quickly subsides and does not interfere with healing.

Dr. Piper.—I used cocaine in 1885, when it was first introduced into this country, and I have continued its use up to the present time, having used a hydrochlorate solution of from twenty to four per cent. The twenty-per-cent. solution was used on the theory that if a very small amount of a strong solution be injected, a better local anæsthesia would be obtained without alarming systemic symptoms.

The local effect was good, so also was the systemic. I then started to use a ten-per-cent. solution, and the results were very good. I think perhaps I used this solution about five hundred times, without an accident or alarming symptom. Now, however, every patient submits himself to an examination in regard to his physical condition before cocaine is used. Thus, having full knowledge of what may be done and what may be expected, we are prepared to meet any serious obstacle to the success of the operation. One case taught me to take this precaution. The experience of accidents caused by the use of this drug by responsible men, as reported in the leading journals, led me to look about for some other alkaloid to take the place of cocaine hydrochlorate. Stumbling on an article by Dr. Arthur P. Chadbourne on tropacocaine, published in a London journal, I became interested, and immediately procured a few grains, and cautiously began with its use, having the first injection made upon myself for the removal of a small bunch on the side of the face. The operation was painless, without the alarming symptoms which were presented from an injection of hydrochlorate of cocaine some twelve months previous. This was encouraging. I began to use it on patients furnished by a physician, who was in attendance to treat any alarming symptoms that might present themselves. After using tropacocaine some six months, I made an appointment with a surgeon to remove an epithelioma from the face of a patient to whom he did not care to give ether on account of the heart. I suggested the use of tropacocaine. He said, "Very

well; if you will take care of the injections, I will take care of the patient." Two grains of the alkaloid were put under the skin before the operation was complete, and, much to our surprise and gratification, not a single symptom from the drug presented itself. While I cannot get the result from tropacocaine that may be secured from cocaine, I prefer to use it because it is much less toxic, and the local anæsthesia very good. I now use tropacocaine more often than I do cocaine.

Dr. Lund.—What strength of solution do you use of the tropacocaine?

Dr. Piper.—Three per cent. It is more expensive than cocaine.

Dr. Lund.—I have tried it only twice, using only a four-per-cent. solution, and I did not get a good result in either instance. The operations in both cases were in inflammatory processes under the lip, and I was discouraged by the failure to produce anæsthesia.

Dr. E. C. Briggs.—I want to emphasize what the essayist has called particular attention to, and that is the obtaining of a wheal. After reading Schleich's paper several years ago, I appreciated that point, and I always aim to produce that wheal, and I find, if I get it, the success of the operation is assured. It was with that in mind that the preparation which is put up by Dr. Kitchen, with a petroleum base, caught my fancy, and I have used it now for two or three years. As would suggest itself to you, this petroleum base has the effect of confining the preparation about the point of injection. I find the greatest difficulty is to prevent the effect from going off into the surrounding tissues. Dr. Potter says that he has had difficulty in obtaining the effect in dense tissue. That is just where I can do the best with it. In the softer parts—say, for instance, where the cheek is reflected upon the alveolus—you will find that the cocaine disappears immediately into the loose connective tissues, and you get no wheal, no local anæsthesia, and there is danger of getting constitutional effects. I use cocaine in extracting teeth, injecting next the margin of the gum, producing a wheal; then I make another injection just inside the limits of that wheal, and then another, and by making three injections on each side the tooth can be extracted without pain. Then by running the syringe down into the socket and injecting as near to the apex as you can get, the socket of the tooth can be bored out, for the purpose of replantation or transplantation, and the whole operation can be done without any untoward effect. The day before Thanksgiving I extracted a tooth which was badly affected with pyorrhœa. Although the tooth was loose, it came very hard; and yet in that

case the extraction was done painlessly. Then I injected into the root socket and cut out the soft tissue that droops down; unless you do that the tooth does not seem to get down to a good base. Then, as I put on the splint, I remarked to the lady that I was sorry she would not be able to enjoy her Thanksgiving dinner, fearing that her mouth would be sore and she would be unable to use the tooth. When I next saw her she said she was better able to eat on that tooth than at any time previous to the operation.

The drug "eucaine" has been receiving considerable attention lately. I wish to say that, coincident with all the cases in which I have used eucaine, I got indurated spots that did not disappear for a long time. Of course, I have sometimes observed this effect after using cocaine, but in the eucaine it was universal, so I went back to cocaine. I have never had any very serious results with cocaine, except perhaps in the case of a gentleman who apparently died while I was injecting cocaine into the tooth to take out the pulp. I was much alarmed, and injected quantities of brandy, and finally succeeded in reviving him. I often thought of that case with feelings of perturbation when I was using cocaine; at the same time there was always a mental reservation as to the cause of the accident. I did not feel that cocaine was the direct cause, but rather that it was shock. Within a week the same gentleman was in my chair. He had a sensitive cavity, and I was about to use the cataphoric apparatus to benumb the sensitive dentine, but he had no sooner taken the cold, clammy electrode in his left hand than he collapsed. He fell back, turned gray, and presented an entirely different appearance from an ordinary faint. It was an extreme case of shock, and I do not know how to account for it unless he has a very bad tobacco heart.

Dr. Eames.—In regard to syncope, I believe that many cases are due to the fact that the patient has eaten nothing for several hours previous to the appointment. Only yesterday I had a case which required some probing in a fistula; it was entirely painless; but the patient immediately fainted. It was about twelve o'clock, and after the patient had recovered I suggested that she should then take lunch, which she did, after which I was able to probe the fistula thoroughly and cut the surrounding tissues without causing syncope in the slightest degree. I have had this experience repeatedly, so that I now do minor operations, not requiring a general anæsthetic, soon after a meal rather than before one.

In regard to the injection of cocaine, I use a syringe having a

solid piston, the whole being made of metal, so that it may be boiled or cleansed in any way we wish. For the extraction of a tooth, I believe that it is better to make several small injections on each side rather than to press the needle in deeply and inject the whole quantity at one insertion. By this means we get the "infiltration of tissue" which is desired. With reference to eucaïne, I consider it more dangerous than cocaine. I believe that those who declare it to be without danger, do so without knowledge. I will admit that it may be used to a great extent without serious results. It takes very extensive experimentation to arrive at the relative toxic property of such a drug, and we have not had that yet. We know that chloroform may be used hundreds and hundreds of times without fatal results, and yet we know that serious results do occur sufficiently often to influence many of us to abstain from the use of this agent altogether.

Dr. Brackett.—I wish to corroborate out of my experience the remarks of the speaker who has just taken his seat in regard to the toxic effects of cocaine solutions being more noticeable in persons who are in need of refreshments. Some of the most unsatisfactory experiences that I have had have been with patients who have come in at an early hour in the morning, having passed a sleepless night, perhaps an interval of several days and nights without sleep, and in many cases having taken but little food. They come to my office in a state of general exhaustion. Patients in that condition are just the ones for whom to be cautious about using cocaine.

I began using the drug as early as it was to be had, have continued its use ever since, and I have felt all along very earnestly that the practitioner who does not avail himself of aid of this kind must be subjecting his patients to a great deal of unnecessary suffering. At first I used strong solutions in considerable quantity. From experience I learned that weak solutions are proportionately more effectual than strong solutions, while, of course, a great deal safer. One of the points which has been brought to my mind this evening is that much more attenuated solutions than those which I have used are effectual. I shall go back to my office and prepare solutions of such strengths as the essayist has indicated and use them with confident expectation of safe and satisfactory results. I feel under especial obligations to the essayist for the information which he has given us.

Early in the use of this drug, Dr. J. W. Smith, who is not now living, put in practice an idea which I believe was original with himself, and which I have previously mentioned before this society.

That was the adding to the solution of a very minute proportion of carbolic acid, which seems to make the cocaine solution less readily absorbable, less likely to produce constitutional effects. From 1889 or 1890 down to the present time it has always been my practice to add a drop of the deliquesced solution of carbolic acid to cocaine solutions, and it is my belief that on account of so doing I have had fewer cases of systemic disturbance. I believe there is another advantage in doing this. Although I always prepare very limited quantities of cocaine solutions at a time, I have felt that the carbolic acid was an additional security against its contracting any septic contamination, and I should, therefore, feel safer in using such preparation in case it had been standing a few days.

With regard to the structure of the tissue into which injections are made, it seems to me that the dentist has some advantages over the operator upon other tissues than the gums. In firm, compact tissues much better results are to be attained than in very loose tissues. An efficient syringe, by means of which considerable force can be supplied, is also important.

Dr. Williams.—The essayist made one remark bearing upon an idea with which I have had some experience. He stated that in a case on which he operated; which resulted in collapse, he “hit him over the heart” and started the circulation. I simply wanted to say that at one time chloroform was substituted for ether, and after that chloric ether was substituted for chloroform, and partly from want of knowledge of the proper application of these drugs many accidents resulted. We always gave the anæsthetic gradually, and when cases of apparent collapse came we produced a bellows’s motion of the chest and lungs by compressing and relaxing the ribs, and by thus forcing air to the heart made the heart act. Fortunately, we never had a fatal case. I had one patient for whom a few roots were to be taken out, and he suggested that his brother, then a young physician, should administer the anæsthetic. I was very glad to have him, of course, and he came and gave chloric ether,—gave it to him till he thought he was insensible. I then took out the roots, and just as I took out the last one the patient fell back, his face became livid, his lips purple, and his eyes glazed, and his breath ceased. The doctor’s face turned as pale as the patient’s, and he called for ammonia or some electrical apparatus. I told him there was no time to look for machinery, and that we must keep up the motion of the chest to get the patient breathing. I began at once to press with a steady, intermittent, regular motion. The elastic expansion of the chest drew the air into the lungs and

stimulated the heart to keep up its action. I have frequently thought since that if we had lost half a minute in looking for apparatus, it would have been a fatal case. So I believe that in cases of collapse, if you keep up the action of the lungs, you are pretty sure to keep up the action of the heart. Dr. Eames and Dr. Brackett spoke of their unsatisfactory experience with patients early in the morning, and I have had several of those cases. Early in my practice I learned that the morning is the time when the nervous system is most readily exhausted or depressed, and is more easily affected by the use of narcotics or stimulants, and the system is more easily drained by effort, mental or physical, than later in the day. Old Dr. Homans said that he often noticed that a dose of opium early in the morning would have a greater effect than after eleven or twelve o'clock in the day. I remember seeing statistics on the subject of delirium tremens by a French physician, and he stated that all of his cases were morning drinkers,—they took the stimulant at the time when the system was most easily upset. In view of these facts, I have always felt that it was important to save the morning strength. Speaking of that to a lady not long ago, she concurred in my idea, and told me of what she thought was a mistake on the part of one old doctor. He used to get his daughters up in the morning to walk around the Common, and not one of them has any nerves now she said. I have also noticed this in studying the obtunding of sensitive dentine. I have found that patients complained more in the early hours of the day than later in the day, so that I came to adopt the rule to make appointments for what promised to be sensitive cases as late as convenient in the day and not in the morning.

Dr. Lund.—I have never used cocaine on the same person more than once on a given day. I think the rule that Dr. Potter spoke of—not using more than one-eighth of a grain—is a very safe one. The face is near the nervous centres, and the effects of the cocaine would be more quickly felt. It would be safe in other parts of the body to go up to half a grain, if you do not do it more than once. I should never go beyond half a grain except in long operations, when a good deal of the cocaine, first injected, has run out through the incision before the remainder is put in.

Dr. Piper.—On one occasion I made an injection of a ten-per-cent. solution for the purpose of drilling through the gum for amputation of the end of a root. The operation was successful, without symptoms of cocaine-poisoning. The next day I had occasion to make another injection for the same patient, using the

same amount of the solution that I did the day before, and, much to my surprise, certain symptoms presented themselves which have been attributed to a toxic dose of cocaine hydrochlorate. My belief that cocaine may be accumulative is based upon this one case.

Dr. Eames.—I should say that cocaine is not cumulative. For the past six years I have used cocaine many times daily, and have carefully observed its effects, and my observations lead me to believe my statement to be correct.

WILLIAM H. POTTER,

Editor American Academy of Dental Science.

THE NEW YORK INSTITUTE OF STOMATOLOGY.

A REGULAR meeting of the Institute was held at the residence of Dr. J. Morgan Howe, 58 West Forty-seventh Street, Tuesday evening, January 4, 1898, the President, Dr. E. A. Bogue, in the chair.

The minutes of the previous meeting were read and approved.

COMMUNICATIONS ON THEORY AND PRACTICE.

Dr. J. G. Palmer.—I have the models here of the mouth of a boy between thirteen and fourteen years of age. He has five lower incisors. The occlusion is as perfect as any I have ever seen.

I would like to have those who take the trouble to look it over express an opinion as to whether it would be wise to extract one of the five incisors. The lower jaw is a little crowded, one of the incisors being twisted somewhat upon its axis and the two canines a little out of position; but the occlusion is so perfect, the general appearance so good, and the boy just at a period when he is developing into a large man, with ample room for every tooth, except the slightly contracted condition referred to, that I am at a loss to know what to advise. I brought it partly for the abnormality, partly for any information I might gain, and to put it among the other models of the Institute.

The President.—Our fellow-member from Paris, France, Dr. Briotti, has handed me two models, which he requests me to present to the Institute. One is the model of a case where the wisdom-tooth impinges upon the twelfth-year molar very extensively, and has caused probably a solution of the cementum and dentine, to the exposure of the pulp. The two teeth were extracted to rid the patient of severe pain. Dr. Briotti had these two teeth dupli-

cated in hard rubber, so that the condition might be seen. The pulp is fully exposed in the posterior root. The other model which he sends contains four bicusps on each side below and two or three above.

Dr. Geer, from Norwalk, Connecticut, has extracted a twin tooth, which he presents to the Institute. It will be seen that there are two complete teeth in the single specimen.

While the specimens are being passed around, I would like the members to take into consideration the various names which I will present to act upon the standing committees for the coming year. I believe it was suggested that each member of the committee should bring in whatever of interest might come to his knowledge, even if he were not able to consult the chairman of the committee.

Dr. W. St. George Elliott.—I would like to report something that has interested me of late. I have been making some tests in regard to the comparative efficiency of some of the instruments furnished us. Dentists have so much to do and so little time, that they generally accept anything that is given to them without question. There is such a thing as a poor instrument, and yet a poorer one, and the most expensive are not always the best. I took up three or four of the chip-blowers and tested them, and the tests were a revelation to me. The most expensive chip-blowers are decidedly the worst. With the most important one—the largest—I succeeded in evaporating between four and five milligrammes of water. With an instrument I made myself (it was nothing but a copper tube), I succeeded in evaporating seven milligrammes of water. The smallest and cheapest, as well as one of the newest, evaporated sixteen milligrammes of water,—three or four times as efficient as the instruments in common use.

Dr. S. C. G. Watkins.—I wish to say in regard to Dr. Palmer's model that we ought to leave well enough alone. The occlusion is fairly good and the appearance not at all bad. It is in the mouth of a boy. Were it in the mouth of a girl, I should perhaps consider extracting, for the sake of reducing the lower jaw, for in a girl the heavy lower jaw is always objectionable. But in the mouth of a boy I do not consider it objectionable; in fact, it may give a degree of character to the face which it would not have otherwise.

The President.—I do not know how often impacted teeth have tried the patience of others, but I was very glad to get the specimens which Dr. Brigiotti has sent to us, as I have had a great deal of trouble in this way. In fact, two patients were given up to die as the outcome of impacted lower wisdom-teeth, but did not. A

third case was that of a physician who came to me, saying that Dr. Hasbrouck had refused to take out his wisdom-tooth, as he was afraid of a fracture. I put a tape between that tooth and the next one, increasing the thickness of my wedge day by day until I had ten or twelve thickness of tape between the teeth, when I sent him back to Dr. Hasbrouck, who finally extracted the tooth, with very slight fracture of the lower jaw. Until this case of Dr. Brigiotti's, I never before saw a pulp of the twelfth-year molar fully exposed by the action of an impacted wisdom-tooth.

If there are no other incidents of office practice, we will close that order of business and listen to the paper of the evening by Dr. Bull, whom I have the pleasure of presenting to you.

Dr. Charles Stedman Bull.—First of all, an apology for a written paper instead of a spoken one; and, secondly, an additional apology, and a request for your patience in listening to a paper in which it has been impossible to exclude absolutely technical phrases.

The paper of the evening was then read by Dr. Charles Stedman Bull, entitled "The Connection between Diseases of the Eye and Diseases of the Teeth."

(For Dr. Bull's paper, see page 137.)

DISCUSSION.

Dr. George S. Allan.—When I called upon Dr. Bull and presented the idea to him of reading us a paper on the connection between diseases of the teeth and diseases of the eye, I may have misunderstood the doctor, but I gathered the impression that he did not think there was very much substance in the subject. So far as I know, nothing like this full and complete presentation of it is to be found; it is worthy of all credit, and certainly marks somewhat of an era in our literature.

I doubt whether many dentists are familiar with these manifestations that are constantly occurring. Certainly the dentists that I have talked with have shown very little more knowledge of the subject than I possessed myself. That we will now pay more attention to these lesions or those close connective phenomena of the organs of the teeth and the eye, I think goes without question. In my own practice I have had very few cases where I noticed any positive connection between diseases of the teeth and troubles of the eye. The most marked one I had was of a girl of twelve or thirteen, where, with very little pain, the orbit of the right eye gradually twisted around, so that in the course of three or four days the axes of the two eyes were at right angles to each other.

This condition remained unchanged for some time, until an oculist, quite a noted man, examined the teeth. Evidently his attention had not been drawn to the connection between the diseases of the eye and diseases of the teeth to such a degree as to examine the teeth in the beginning. It was only when the case proved obstinate, and he could not accomplish any good results, that he finally examined the teeth. The sixth-year molar was badly decayed and ulcerated in one of the roots. The extraction of that tooth resulted, in the course of three or four days, in a cure. The eye turned round to its normal position, and there was no further pain or trouble.

I, for one, feel much indebted to Dr. Bull for this very complete presentation of the subject, much more complete than I had expected or even hoped for, and so I have risen to start the discussion.

I would like to ask Dr. Bull if in his practice he has ever noticed any cases such as he describes where the beginning of the trouble was in the eye, and the teeth afterwards were affected by reflex action or in any way.

Dr. Bull.—Indirectly, yes. I have one notable case in my experience, of a man, forty-eight years old, who went to his dentist complaining of a severe pain in the second upper molar on the right side. Upon examination it was found to be a perfectly sound tooth. The pain finally left the second molar and went to another tooth, and then to the lower jaw, but always kept on the right side. Nothing wrong could be found in any of the teeth of which he complained at various times. This persisted for a number of months, to such a degree that he was forced to take narcotics. He began to use cocaine hypodermically, and then commenced to complain of flashes of light in his right eye. Some one suggested that perhaps he needed his glasses changed, as he had worn the same ones for several years. He came to me simply because certain members of his family had been to me. He said that, when looking at a light, he saw colored rings around it. Seeing rings of colored light is one of the first symptoms of the disease that we call glaucoma. This man had developed acute glaucoma, and, so far as we could determine, it had already existed about eight months. The vision remained impaired.

The President.—Was there any more pain?

Dr. Bull.—When the glaucoma became fully developed the pain became continuous, and he had excruciating pain in the eye until after the operation. It then ceased and did not return.

The President.—Were the teeth not diseased in any way?

Dr. Bull.—The dentist informed me that they were not. Several of the teeth that he complained of were filled, and it would seem probable, inasmuch as the pain in the teeth ceased with the development of the glaucoma, that it was reflex, and not due to existing disease in the teeth.

Dr. Allan.—It certainly seems reasonable that such conditions should exist, and that a great many of the possible cases of neuralgia, the origin of which has seemed to us very obscure, may have had their origin in some troubles of the eye, just as troubles in the eye proceed from primary troubles in the teeth.

Dr. Bull.—I consider it perfectly possible.

Dr. Allan.—Certainly, as dentists, we are constantly having cases where we feel unable to locate the primary cause, and I have known of several cases where sound teeth have been extracted without good results.

Dr. C. A. Woodward.—I remember a case that came to my notice, of a lady who had a great deal of trouble with one of her eyes. She had been to many oculists for treatment, without relief. The trouble extended over some years. Finally, she came to me, and I thought I detected a slight sensitiveness in one of the canine teeth which had been filled. I removed the filling, which had been near the pulp, but the pulp was still alive. I began to treat the tooth for its sensitiveness, and finally made up my mind to remove the pulp. Upon getting into the pulp-chamber I found a pulp-stone, which nearly filled it, and when that was removed the eye ceased to give trouble.

Dr. C. O. Kimball.—I am very sorry that I have no clinical observations to give on this matter. My attention was called to it twenty-five years ago, but it so happens that I have never had any of these cases where the eye has been directly involved in trouble beginning in the teeth. Within the last week, however, I have had a case which has bothered me somewhat, and I would like the opinion of some of the gentlemen of the Institute. A lady has been troubled with a dry joint of the lower jaw on the right side, giving pain and annoyance, and this has continued for some six or eight months. Recently she came to this city, and her physician sent her to me to see if there was any trouble with the teeth. She has not only had pain in the joint and a creaking sound on motion, but also some neuralgic pains, the cause of which I have been unable to locate. I made a very careful examination of the teeth on that side, which are more or less diseased, but found no evidence of difficulty with them severe enough to warrant the belief that the failure of the

synovial fluid came from irritation of the teeth. I wish to ask if any of the other members of the Institute have seen anything which would lead them to think that this disease in the joint might have been directly or indirectly caused by trouble in the teeth?

Dr. Benjamin Lord.—We should all certainly feel much indebted to Dr. Bull for the elaborate paper he has favored us with this evening. He has shown that any diseased condition of the eye may be much more due to some irritation of the teeth than is generally supposed.

The subject is one that should not only interest the specialist, but the general practitioner, who, as we well understand from our experience and observation, almost entirely overlooks the influence of the teeth in a diseased condition upon the general health.

When the time comes, and it will come, I trust, that all dentists as well as oculists and aurists will study and become well grounded in general medicine and surgery, so as to understand the systemic as well as the local effects of diseased conditions of the teeth, it will tend greatly to enhance our usefulness to our patients.

I think we may consider that at least most of the cases the essayist has used in illustration of his subject had not been treated by skilful dentists, or perhaps not treated at all.

Dr. A. G. Weed.—I have frequently found pulp-stones the cause of pain in superior maxilla, patient complaining of pain on the floor of orbit, decided lachrymation on same side. Two such cases have been entirely cured by removal of pulp-stones from first molar. In a third case, with like symptoms, the pulp-stone was found in the first bicuspid.

Dr. F. Milton Smith.—I have been greatly delighted with the paper. It seems to me that, in our desire to save teeth and in our thought of the teeth, we often lose sight of those causes that are attributed to them, yet for which they are not responsible.

We ought to save every tooth that we possibly can, providing that in the saving we do no greater injury to another part of the system than that we seek to relieve. In a number of the cases that Dr. Bull has referred to, he has suggested that the extraction of the tooth has relieved the trouble. There is a tendency sometimes to resort to extraction long before it ought to be. There are many cases of diseased antrum which affect the eye. Many of these cases may be, and are, cured, and the teeth saved by proper treatment. It is a mistake to remove the tooth in these cases. I have had no extended experience with troubles involving the eyes resulting from

teeth, but it would seem to me reasonable that the eye would be one of the organs affected. We do know that the teeth often are the cause of troubles with other portions of the body, the opposite being also true. I cannot discuss the paper from a scientific standpoint, but think Dr. Bull should have a vote of thanks for his very able and interesting paper.

The President.—I was hoping, gentlemen of the Institute, before putting this vote of thanks, which I am very glad to do, to say a word or two and to hear Dr. Bull's reply, if we might, as our evening is not quite gone yet. I was very much struck with one peculiar feature which seems to have been developed by Dr. Bull's excellent paper,—that in all the cases which he enumerated not one has been brought forward that has not been preceded by long-continued neglect of teeth. There is no instance that he mentions (Dr. Bull indicates that I am correct), where these eye difficulties or orbital difficulties supervened, in which great neglect of the teeth has not first been manifested. I did not know but that he was going to put exophthalmic goitre on the shoulders of the dental organs before he got through. In one of the instances Dr. Bull mentioned, there was an upper molar whose root was exposed, roughened, sensitive, and abscessed. Now, that to us is an impossibility, and it shows that the observer, whoever he may be (I understand Dr. Bull quoted it), was evidently not posted in the beginnings of dental disease. This paper shows me more than ever the necessity of the studies which we have undertaken to carry on for ourselves, and possibly for some others, that may eventually bring us a little nearer to the great body of practitioners of the healing art.

The instance that Dr. Bull gave us, of extracting a tooth and finding a wooden toothpick as the origin probably of suppuration which had extended very widely, is only confirmatory of what has just been stated. There was a foreign body which nature was endeavoring to expel, and it would be quite immaterial whether that foreign body were a toothpick or a tooth which had been roughened, or anything else. We must all recognize reflex action. We recognize how little children eat indigestible food of some kind or another, and through the pneumogastric nerves there is a discharge of mucus all along the track of the mucous membrane until the lungs become involved and false croup results. There is an instance of reflex action which is patent to all of us, and those of us who have brought up children probably know more acutely about it than the younger members who have not. But it seems to me that there is considerable point in a great many of the thoughts

that Dr. Bull has brought up. I hope, before we pass our vote of thanks, that he will enlighten us upon some of them.

Dr. Bull.—In going over the literature of this subject in ophthalmological text-books and journals, the fact that impressed me more than anything else was that a description of the diseased tooth in every single case was in the language of the oculist and not in that of the dentist; and it is scarcely necessary to remark that the oculist is absolutely incompetent to make any statement as regards the existing conditions of a tooth.

The main object I had in writing the paper was to show my belief that there is no such thing as a pure, narrow, rigidly bound specialty in medicine; that every single branch of medicine is more or less intimately connected one with the other, and in talking over this subject with my fellow-oculists in this city I was surprised to find how little interest many of them took in the subject.

Now, I am a specialist in medicine, and I have always said, from the time I began as a teacher, twenty-five years ago, here in New York, until now,—and I repeated my remark this afternoon at my lecture,—that I have no belief in a pure specialist who knows nothing else. He does not even know his specialty if he does not know anything of general practice. A poor specialist in medicine, outside of dentistry, is the man who has not been a general practitioner first, and if this paper does anything towards bringing into more close connection dentistry and ophthalmology, I shall be satisfied that I have done a good thing.

A vote of thanks was tendered Dr. Bull for his valuable paper.
Adjourned.

S. E. DAVENPORT, D.D.S., M.D.S.,
Editor The New York Institute of Stomatology.

Editorial.

PRACTICE OF DENTISTRY IN FOREIGN COUNTRIES.

THE question is so frequently asked, "Upon what conditions can I enter practice in foreign countries?" that a brief statement of what a proposed resident in other lands must undergo may have its value to those who look with longing aspirations in that direction.

The extraordinary demand for the degree of Doctor of Dental Surgery has led to a great increase in the number of dentists in all our large centres of population, and the young aspirant for professional honors, feeling that all places are crowded in this country, seeks other fields to conquer. It is the old, old story of the gold-seeker. It was the Eldorado of the Spanish invaders, it is the Klondike of to-day, and professionally it is the foreign field where it is supposed the American dentist holds a pre-eminent position, and, being thus favorably situated, can command a practice and revenue largely in excess of his brethren less favorably circumstanced at home.

The idea that American dentistry is held at a premium in all foreign centres of civilization is so thoroughly engrafted on the dental mind through the labors of the eminent men who early braved all the difficulties and annoyances of expatriation, that it is almost a waste of time to endeavor to show that, whatever the financial returns may have been in the past, or even may exist in the present, they no longer, as a rule, are within the grasp of the graduate of to-day.

The tendency of all governments is towards protecting their own people. The competition in life has become so sharply concentrated that nationalities have felt forced to intrench themselves behind tariffs and restrictive laws for their own protection. We may inveigh against this as the product of the selfishness of the age; but while it is all this, it has its origin in the ever-existing fear of present and future financial injury.

The very fact that American dentistry secured recognition abroad raised an opposition in the minds of the members of the same profession in foreign lands. This was a natural result, and these men turned to law for protection in exactly the same way and for the same reasons that the residents of the several States in this country say to others of their countrymen, "This plot of ground is ours, and no man shall enter and reap the harvest except by our consent."

It has so happened that the writer of this has been consulted a score of times by young men anxious to go abroad, and invariably the answer has been given that it was unwise to attempt it.

The reasons for this advice are plentiful, but to the inexperienced rarely have weight. The first and most tangible difficulty, and can, in a measure, be appreciated, is inability to converse. To acquire a reasonable fluency in the use of a language is a matter of long practice and constant study; and until this is accomplished, at

least in degree sufficient for daily use, success in securing and holding practice is not brilliant.

Presuming, however, that this really minor difficulty is overcome, and the aspirant for dental honors and emoluments has passed safely through the meshes of the legal nets thrown around him and has successfully sailed his bark into smoother seas, what has he to look forward to as the result of his labors? He may secure a large practice; he may even roll up a large bank account. He may marry and rear a family, and what then? He finds himself, as age creeps on, a man practically without a home. He may have all the beautiful surroundings of one, but, while an American at heart, he is no longer part of that free life he enjoyed in his youth. He has outlived everything once dear to him there, and has not become a part of the real life of the people among whom he is a worker. He is truly an exile from all that makes life worth the living. He sees his children growing up around him who know nothing of his early life or of its people. He would gladly make them Americans, but their young minds grow naturally into their surroundings. They speak his mother-tongue imperfectly, but are proficient in that of the country he inhabits. He cannot change the course of development of minds trained, as theirs must be, in the habits, customs, and the educational processes of the country; and so, in time, these children of his grow to be entirely uninterested in American life and its larger possibilities. The still darker prospect haunts him that the second generation will become citizens of the country he has learned to dwell in, but not to love.

While this is true of most countries, it is even worse in some, where it is absolutely impossible to rear children and educate them properly. These must be sent away thousands of miles to receive necessary mental training. The illustration of a father of a family toiling away in China, with that family in England, with no prospect of a reunion for years, is not a pleasant picture to dwell upon, and yet this is exactly the situation of one the writer recently met, and who sorrowfully stated the fact. Money failed to compensate in this case.

The idea that the financial returns are larger in some foreign city than at home is an error. The few favored men who have accumulated fortunes are the exceptions abroad, as they are the exceptions at home; but, were it all true, will money compensate for the deprivations to which allusion has been made?

This word of warning would seem almost useless, in view of the fact that the laws of nearly all countries are now in direct op-

position to the practice of dentistry in foreign lands; yet, notwithstanding this difficulty, there is a class of young men, full of energy and adventurous spirit, who are willing to accept positions as assistants to American dentists abroad, and that without due consideration of the present and future difficulties they are sure to meet. For these the caution is extended, but that it will be regarded is not expected; for advice does not weigh in the balance with a salary in gold.

The anxiety to learn something of the laws regulating dentistry in foreign countries induced the Department of State at Washington to instruct the various consuls to report. These have been published, and through the kindness of the Secretary of State the writer is enabled to give abstracts of these reports upon another page. They will be found of interest to all, whether contemplating a permanent residence abroad or as instructors at home; for the latter are continually pressed for information in these directions at the graduating period. It will be observed that practically all doors are closed to the American dentist; and those contemplating entering its ranks must be made aware of the fact that the struggle for existence must be made in their own country; and this can best be carried out there amidst congenial surroundings, and in the end will insure a life of comfort, if not of luxury.

Bibliography.

THE INDIANA DENTAL JOURNAL. Edited by George Edwin Hunt, M.D., D.D.S. Vol. I., No. 1. Indianapolis, January, 1898.

Another candidate for professional favor has been sent forth to the world from Indianapolis, with Dr. Hunt as editor.

The first number presents a neat appearance and is typographically very satisfactory. It is to be published monthly by the "Indiana Dental Journal Company." Exactly what that may mean is not stated, but it would be a gratification if it were proved to be entirely independent of supply houses.

In wishing it entire success, it is to be regretted that it is started on lines which, if continued, will not redound to the honor or dignity of the dental profession. Dentistry has had much to contend with in the past, and has yet a large number connected with it

who fail to see that a dignified literature is as equally important as dignified personal bearing, if the respect of the intelligent, thinking world is desired. Slang, cheap wit, rhymes, and novelettes are not exactly the mental food to spread before professional men at the close of the nineteenth century. It is most desirable that the editor should see his way out of this literary mire and eventually give the twentieth century a journal worthy of his name and reputation.

A TREATISE ON IRREGULARITIES OF THE TEETH AND THEIR CORRECTION. By John Nutting Farrar, M.D., D.D.S., Esq. The International News Company: New York, London, Leipsic, 1888-97.

The second volume of this great work of Dr. Farrar came to us too late for extended notice in this number, a full review being necessarily deferred until the April issue. A cursory examination of the contents leads to the conclusion that this volume more than sustains the reputation of the author, treating the practical side of irregularities of the teeth so exhaustively, and at the same time with such clearness and simplicity of expression, that all who read cannot fail to learn.

This volume has been prepared with the same care as that given to the first, both of them being superior specimens of the printing art.

Obituary.

RESOLUTIONS OF RESPECT—MASSACHUSETTS BOARD OF REGISTRATION IN DENTISTRY.

WHEREAS, In the sudden death of Dr. E. V. McLeod, which occurred November 24, 1897, the Massachusetts Board of Registration in Dentistry has lost one of its original members, who during its existence of eleven years has served as secretary.

Resolved, That in the death of Dr. McLeod the Board has sustained the loss of one who has been most efficient and faithful to its duties, giving an immense amount of his time to its work.

Resolved, That as an examiner he displayed wisdom and discretion and wonderful tact in dealing with men.

Resolved, That in his contact with his associates on the Board his kindness of nature and generosity of heart will always be remembered with the warmest affection.

Resolved, That we extend our sincere and heartfelt sympathy to his bereaved widow in this her great affliction.

Resolved, That these resolutions be entered on the records and a copy be sent the widow of the deceased and to the several dental journals for publication.

(Signed)

JOHN F. DOWSLEY.

GEORGE E. MITCHELL.

THOMAS J. BARRETT.

DWIGHT M. CLAPP.

RESOLUTIONS OF RESPECT—AMERICAN ACADEMY OF DENTAL SCIENCE.

DR. THOMAS W. EVANS died suddenly of angina pectoris in Paris, November 14, 1897, aged seventy-four years. He was born in Philadelphia in 1823, and received in that dental centre, in his youth, theoretical training and practical experience in fine metallurgy and in dentistry. At an early age he was led by Dr. Brewster to go to Paris, and he there achieved one of the most brilliant careers which any dentist has ever accomplished. He was proficient in dental manipulations in the days when there were fewer skilled practitioners than there have been in recent years; and his other strong qualities enabled him to secure and retain as patients many of the most prominent persons of the world.

His services were not confined wholly to the routine of dentistry, but his abilities found channels for action in various hygienic, sanitary, and reform measures, and in a private diplomacy for which he was fitted by nature, and for the exercise of which he had unusual opportunities. In addition to his work as a brilliant practitioner his career was a marked illustration of the fact that the practice of our calling is not incompatible with high social position and the attainment of many honors through faithful service in other capacities. Born in America, and with American general and professional education, he kept up his acquaintance with our people and his friendship for our institutions. Embracing opportunities for lucrative investments, he became very wealthy; and it was his cherished design, whose fulfilment it is to be hoped no circumstances will frustrate, to devote a large part of his accumulations to the establishment of art and educational institutions in his native city.

Dr. Evans had been for many years an Honorary Fellow of the American Academy of Dental Science. In recognition of his high career and in testimony of our respect to his memory, we devote these pages of our records to this expression concerning him; and we would commend to our members the emulation of all that was

worthy in his example, of thorough preparation for the life-work, of diligence in its pursuit, and of broad-spirited usefulness to the world as a man, a citizen, and a bestower of the rewards of his labors.

(Signed)

CHARLES A. BRACKETT,
ROBERT R. ANDREWS,
EUGENE H. SMITH,
Committee.

Notes and Comments.¹

NATURE AS AN EDUCATOR.—Dr. Holbrook, in the *Scientific American*, says that nature is, in the physical sense, the father and mother of us all, and that a child that grows up to maturity with a genuine love of the rocks and trees, flowers and insects, storm and sunshine, fresh air and the ocean wave, and all the activities about us, stands a better chance of possessing a healthy nervous system and of maintaining it during life. Nature is a great book, whose authorship is the infinite, and I am not in sympathy with any system of education which takes children, young or old, far away from nature.

TREATMENT FOR CARBOLIC ACID BURNS.—Bathe the burned tissue freely with alcohol, or touch the burned area with chloroform. If this is not employed soon after the burn, however, it will have little or no effect. The *University Magazine* says, when some time has elapsed since the burning, brush the parts with a saturated solution of picric acid in water.

THE TRANS-MISSISSIPPI EXPOSITION, in 1898, promises to be a wonder. An immense fund has been raised for its success. The National Dental Association members need have no fear that Omaha cannot accommodate all who attend. Similar doubts were expressed when the American Association decided to go to Excel-

¹ The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 1718 Walnut Street, Philadelphia.

sior Springs, near Kansas City, a few years ago, but the result was a successful gathering and perfect satisfaction with the accommodations. The Western meetings at Minneapolis and Excelsior were among the best in the history of the American Association.—*Western Dental Journal*.

BURNED BY RÖNTGEN RAYS.—A young woman who had the X-rays used recently to determine the nature of a supposed affection of the antrum of Highmore has since lost all the hair from the side of the head exposed to the rays, and the skin of her face and neck were also blistered. This is of the same nature as a case reported by the writer over a year ago, where a young man had the right cheek exposed to the rays several times for about five minutes at each sitting. The result was that in a few days he lost all of his beard on that side of his face.

NOVEL METHOD OF ARRESTING HEMORRHAGE.—Dr. Bienwald describes, in the *Semaine Médicale*, an ingenious method employed by him to control the bleeding from a small wound of the face in a case of hæmophilia in a child two years old. Having failed to arrest the hemorrhage by the application of ferric chloride, some blood was obtained by aspiration from a healthy subject and deposited upon the wound. In a few minutes coagulation took place and the hemorrhage at once ceased.—*Dental Digest*.

THE BLUE PENCIL.—The following suggestions are given by Dr. Barrett in the *Dental Practitioner*: A blue or red aniline pencil is a great convenience to the dentist, in either the laboratory or operating-room. It serves to mark a cast for relief, or for the borders of the plates, the positions of the teeth, etc. But its greatest usefulness is found in articulating and grinding artificial teeth, crowns, fillings, etc. The surface to which a crown or filling is to be adapted is heavily marked with the pencil, and the occlusion then made. The pencil mark is transferred to the exact point to be ground off. It is quite as effective and much more convenient of application than the articulating paper sold for that purpose. Keep an aniline pencil constantly within reach when at your work, and it is surprising how often it will be found useful.

ADHESIVE CEMENT FOR PLATE- AND BRIDGE-WORK.—It is always desirable to have on hand a reliable cement for repairing plaster impressions, for the temporary adjustment of clasps upon plates, for the “waxing up” of teeth in plate- or crown-work, etc., and the following formula is presented for that purpose by Professor W. F. Litch:

Take of

Pitch	100 grains.
Gutta-percha	100 grains.
Gum dammar	150 grains.

Process.—Melt the pitch in an iron pot over a sand-bath; cut the gutta-percha into small pieces and add piece by piece, stirring constantly until all are thoroughly dissolved, then add the gum dammar, and continue stirring until it is melted and completely mixed with the other ingredients.

Finally pour the melted mass into a large basin of cold water, and before it has entirely hardened remove and cut into strips of suitable size.

FOREIGN RESTRICTIVE LEGISLATION.—Recent legislation in France makes it practically impossible for a foreigner to there practise medicine. Before being permitted to practise, regardless of his previous qualification, he is required to first acquire the French B.A. degree, and then go through a five years' curriculum. This means that he must spend seven years in France before being allowed to practise, and this, no matter who he may be, how well known, or what position he may have occupied.—*New York Medical Journal*, vol. lxvi., November 13, 1897, page 674; from the *Boston Medical and Surgical Journal*, October 28, 1897.

IN making gold solder, pure zinc should always be used, the chemically pure metal prepared for the use of analytical chemists. It is desirable, also, to use for this purpose pure metals only, and especially for bridge-work to strictly adhere to a fixed formula. Toilet-pins, brass, spelter, brass wire, etc., are all of unknown composition. We may know the principal metals of which they are composed, but of the impurities always found in metals, as commercially sold and used, we know and can know but little. When pure metals only are used, gold solder can be made as tough and free from brittleness as good gold plate.

Current News.

THE NEW YORK INSTITUTE OF STOMATOLOGY.

THE following officers were elected for 1898: President, Dr. E. A. Bogue; Vice-President, Dr. C. A. Woodward; Recording Secretary, Dr. F. Milton Smith; Corresponding Secretary, Dr. George A. Wilson; Treasurer, Dr. J. A. Bishop; Editor, Dr. S. E. Davenport; Curator, Dr. J. G. Palmer.

Executive Committee.—Dr. A. H. Brockway, Dr. C. O. Kimball, Dr. J. Morgan Howe, Chairman.

NINTH INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY.

THERE will be held in Madrid, Spain, April, 1898, an International Congress, devoted to the "discussion of questions appertaining to individual and collective hygiene, and to the science of population. It will consist of lectures, the reading of themes, discussions, and practical demonstrations with new instruments and apparatus. The governments of all countries, the provincial and municipal administrative corporations, the universities, academies, schools, and scientific societies that occupy themselves in questions bearing relation to hygiene and demography are invited to give their help to the congress and to send delegates to be their representatives in it."

Those desiring further information can apply to the Secretary-General, Dr. Amalio Gimeno, Madrid, Spain.

RHODE ISLAND DENTAL SOCIETY.

At a meeting of this Society, the resolutions of the American Academy of Dental Science, Boston, Mass. (INTERNATIONAL DENTAL JOURNAL, May 1897), relating to the character of the advertisements appearing in some of the self-styled dental journals were re-adopted by this body, and the secretary was directed to forward this decision to the dental journals.

CLARENCE A. CARR,
Secretary.

THE International Dental Journal.

VOL. XIX.

APRIL, 1898.

No. 4.

Original Communications.¹

TREATMENT OF PULPLESS TEETH WITH HYDROGEN DIOXIDE, ETHEREAL SOLUTION.²

BY GEORGE S. ALLAN, D.D.S., NEW YORK.

NOTWITHSTANDING the great amount of study and care taken by biologists and chemists, the production of an ideal germicide for stomatologists seems yet afar off. In medicine the chief uses for which a germicide or antiseptic is employed is either to keep pathogenic germs outside the system or from open cuts or wounds, or to provide a serum that will render the system immune to their hurtful action. So far as the teeth are concerned, for reasons not necessary to mention, the main want seems to be to find a germicide that will either utterly destroy the germs of putrefaction and fermentation, together with the decomposing contents of the pulp-chamber and tubules of so-called "dead teeth," or form with them some indestructible and inert compound, one that will not be a menace either to the safety or appearance of the teeth afterwards.

None of the organic germicides, such as creosote, carbolic acid, or any of the essential oils, will meet the conditions. Most of them are simply antiseptics, temporarily only inhibiting the growth of

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before The New York Institute of Stomatology, February 1, 1898.

germs. Very soon they become an additional source of danger, for in time they are acted upon by the germs and destroyed, and so add fuel, as it were, to the flames. A pledget of cotton, soaked with any one of the above-named agents and placed in the open cavity of a tooth, in a few hours becomes offensive and exhibits all the characteristics of decomposition and destruction. Of all the agents employed that will act upon dead tissues and form an indestructible compound, formaldehyde, I believe, is the most effective. I am uncertain, though, as to the duration of the compound that is formed,—that is, whether it is absolutely indestructible by the agencies in the mouth for any great length of time.

Formaldehyde is a gas that is held in solution in water. A forty-per-cent. solution is generally employed, but it is not permanent, for even if kept corked it is constantly losing its efficiency. In a preparation that I have had for a year or so in my office, one can to-day hardly detect the odor by placing it to the nostrils. And the odor is usually very strong and pungent. It is, however, a most valuable agent, is a real germicide, and is rapidly growing in favor.

The action of hydrogen dioxide is that of a destroying agent. It unites with the organic products of a dead pulp and absolutely destroys them as well as the germs themselves. The dead material is carried away with the gases generated. Hydrogen dioxide is simply oxygenated water. The symbol of water is H_2O . Hydrogen dioxide is H_2O_2 . In other words, there is an extra atom of oxygen united with the two atoms of hydrogen. Pure hydrogen dioxide is a heavy liquid which is a chemical curiosity and most dangerous to handle. We know it only in its solutions,—either the aqueous or the ethereal solution. The two solutions have somewhat different properties, although acting on the same lines. The H_2O_2 , in breaking up, becomes H_2O plus the atom of oxygen liberated, and it is this atom of freshly liberated oxygen that does the work sought for. The ethereal solutions, five and twenty-five per cent., we are acquainted with are fairly permanent ones. The figures are accurate, and really represent the strength of the solutions. They are caustics, but their caustic properties are not injurious, and soon pass off. The treatment of a tooth containing a dead pulp with H_2O_2 is a very simple matter. The object desired is to bring it to an aseptic condition, and it is to this point more than all others that I wish to draw attention. The virtues of H_2O_2 , as a bleaching agent have been heralded for several years, and in the hands of almost all good practitioners it has become an agent

they cannot do without, its action being so quick, so certain, and so satisfactory to both operator and patient. But no attention, so far as I am aware, has been drawn to the fact that these teeth ought to be treated with H_2O_2 , or with some other germicide, not alone to bring about the natural color, but also to restore the teeth to a healthy and, so far as possible, aseptic condition. I have been in the habit, since the first preparations were brought to our notice, of treating pulpless teeth, even molars and roots preparatory to capping, where discolorations would not be noticed, with H_2O_2 , for the purpose of bringing them to a healthy condition, and the practice is proving very valuable. The treatment is, of course, the same that one would employ in bleaching: the apices of the roots being closed and the rubber dam applied when possible, the H_2O_2 is freely used.

As to bleaching I would say a word. Many use a twenty-five per-cent. ethereal solution and some a five-per-cent. for this purpose. Others still claim they obtain a more prompt and effective action by means of the electric (cataphoric) current. So far as I can see, there is nothing gained by using the cataphoric current for bleaching purposes. There is no advantage in using the twenty-five-per-cent. solution of hydrogen dioxide, and I always employ the five-per-cent. solution. If a five-per-cent. solution is used the evaporation soon reduces it to a twenty-five per-cent. solution, and by repeatedly swabbing out the cavity the desired change in color can be quickly obtained. I do not know that I have ever failed in my effort to bring a discolored tooth back to its normal color. It is well to be cautious and stop a little short of the full measure of success. Then seal a small quantity of the five-per-cent. solution in the tooth for a day, and usually no further treatment will be required. Bleaching can be, and often is, overdone. Great care should be exercised in guarding the adjoining teeth, if living, from the action of the agent. Even if the tooth be sound it may be affected, but if there happen to be an open cavity, there will surely be trouble and possibly intense pain, which may last for several days. A gold filling is only a partial preventive at best. To guard against these unpleasant sequences one must either isolate the tooth he is operating upon or else protect the adjoining teeth with a coating of wax or rubber in some way, so that the H_2O_2 will not come in contact with them.

Whenever it becomes necessary to remove the pulp from a tooth, the contents of the tubules also should be removed, for the latter are quite as likely to prove a cause of future trouble as is the pulp

itself. In fact, it may safely be asserted that far too little attention has in the past been given to this point. It is only partly true that the dentinal fibres are hermetically sealed in the tubules after the pulp-chamber has been filled. The contents of pulp-chamber and tubules once removed, too great care cannot be taken to prevent the ingress of germs or germ foods in the future. H_2O_2 is, so far as I know, the only agent that will completely make way with everything objectionable.

In the treatment of deciduous teeth, when from the absorption of the roots root-filling is impracticable, an easy and reasonably sure method of practice is, after the removal of the pulp and contents of tubules, to first sterilize the pulp-chamber and tubules by using the three-per-cent. aqueous solution of hydrogen dioxide. The open ends of the tubules should then be closed with some preparation like cavatine, and the cavity and pulp-chamber only filled with gutta-percha or other soft filling-material. A temporary tooth carefully treated and filled in this manner seldom gives trouble, and the absorption of the roots is not necessarily interfered with.

"The most satisfactory method of obtaining absolute H_2O_2 for dental purposes is by immersing a pledget of absorbent cotton in pyrozone, twenty-five-per-cent. solution, and allowing the ether to evaporate. To prepare a fifty-per-cent. solution, it will be found most satisfactory to employ glycerin as the solvent. One tube of pyrozone, twenty-five-per-cent. solution, should be poured on fifteen minims of glycerin and allowed to stand in an open dish until the ether has evaporated. The glycerin will then contain fifty per cent. of H_2O_2 . The uses of a solution of this strength will readily suggest themselves to the practitioner. Aqueous solutions of twenty-five-per-cent. strength can be readily prepared by shaking the contents of a tube of twenty-five-per-cent. solution with half a drachm of distilled water and separating the mixture through a funnel, or, better, by means of a pipette drawing off the ether floating on the top. The lower layer will contain the H_2O_2 in aqueous solution. Pyrozone, five-per-cent. solution ethereal, can be prepared by adding the contents of one tube of pyrozone, twenty-five-per-cent. solution ethereal, to half a fluidounce of pure sulphuric ether." It is interesting to note the behavior of the different aqueous solutions towards nitrate of silver. If there should be any hydrochloric acid present, its presence will be indicated by a more or less flaky precipitate. A faint opalescence however, does not indicate any acid reaction.

The twenty-five-per-cent. ethereal solution comes in small tubes hermetically sealed. They can easily and without any danger whatever be opened. It is wise to cool the tube before making the attempt. Then hold the tube wrapped in a wet towel, and gently cut the end with a file and break it off. Make the cut some distance back from the tip, and point the tube away from the face.

The most convenient vessels that I have found in which to make the aqueous solutions are the one-drachm (120-minim) glasses to be had at all druggists. Those with parallel sides are to be preferred. This aqueous solution, however, is not permanent. It can be kept for perhaps a week, but it gradually deteriorates and becomes cloudy and unfit for use, but as it is quickly prepared, one need not deny himself any advantages it may offer.

The aqueous and glycerin solutions of H_2O_2 do not seem to give the same amount of pain as the ethereal solutions, and this because the ether evaporates much more rapidly than the glycerin, and there would not probably be the same rapid disengagement of gas. I have within the last few days taken the twenty-five-per-cent. aqueous solution and swabbed out cavities with it in living teeth when excavating, without saying anything to the patient, and no notice was taken of it. I make these remarks with some caution, because I do not know what further experiments in this line may lead to, so that I would advise any one who thinks of using them to be cautious, because the pain that this H_2O_2 gives is greater than that caused by any other germicidal solution that we have; if we could get rid of that one objection, I think it would take the place of every other germicide for dental purposes.

Wishing to demonstrate the action of the ethereal solutions of H_2O_2 , whether it would penetrate from the tubules through the cementum and to the outside of the tooth, I took this double root of a molar and coated the outside with wax, and also the exposed broken end, so that the only entrance for the H_2O_2 would be through the pulp-chamber; I then put it in a twenty-five-per-cent. ethereal solution and left it for an hour. As will be seen, the tooth, which was very much discolored and quite dark, is now restored to its normal color outside as well as inside, showing that the action of the H_2O_2 has been through the tubules and cementum, and that if the treatment had continued a great length of time there would have been pain in the socket of the tooth from the penetrating property of the gases through the whole thickness of the tooth to the peridentium. In bleaching teeth in the mouth I have many times obtained the same results. I have seen a portion of the roots

exposed, stained dark yellow or brown, and restored to their natural color, the exposed portion of the root as well as the crown, and wholly from the action of the H_2O_2 in the pulp-chamber. Enamel is likewise penetrated by it through the dentine, but more slowly.

STUDIES IN EVOLUTION.

BY EUGENE S. TALBOT, M.D., D.D.S., CHICAGO, ILL.

No tissues of the body are exempt from malformations, but this is more markedly apt to affect structures and organs which are undergoing constant changes during evolution. The face, jaws, teeth, and vermiform appendix are marked examples. In the *INTERNATIONAL DENTAL JOURNAL*, February, March, and April, 1897, in an article on "The Degenerate Jaws and Teeth," I showed how, in the order of evolution, these structures were degenerating and producing deformities and irregularities of the structures. My results confirmed the concrescence theory of Magitot and the differentiation theory of Osborn and Cope as the manner of formation of the bicuspid and molars.

The lower marsupials and the lemurs had forty-four teeth, and with rise in the scale to man the jaws have become shorter with fewer teeth. As the jaws are still growing smaller, nature is trying to compensate for this by dropping the teeth at the two extremes of the jaw, the laterals and the third molars. The same is true in atavism: the extra teeth in the majority are located in the anterior and posterior part of the jaw. It would be reasonable, therefore, that, under certain conditions, instead of removing the teeth in the anterior and posterior part of the mouth, nature would occasionally produce such freaks as occur in the face, jaws, vermiform appendix, and monstrosities. This is most often the case in the third molar. It is not so frequently the case with the teeth in the anterior part of the mouth.

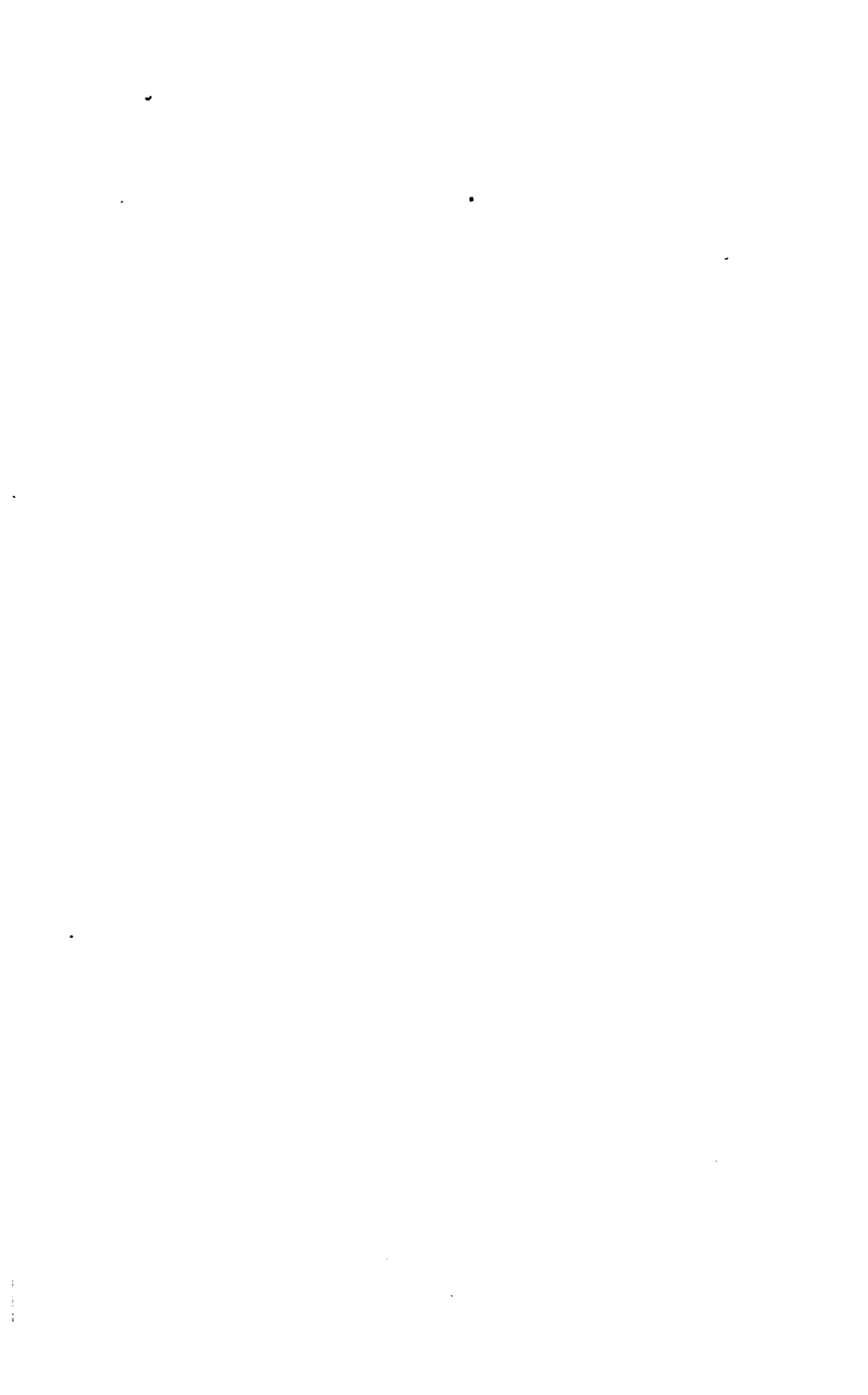
I have occasionally noticed such cases, two of which are illustrated in this article. These models were obtained at the Dental School in Paris, France, some years ago. Fig. 1 shows all the anterior teeth normal, except the central incisors. Here nature undertook by the differentiation or budding process to produce two molar teeth, but fell far short of it. The right monstrosity is apparently an incisor reversed, the palatine surface being near the lip with a

FIG. 1.



FIG. 2.





number of buds coalescing in the palatine surface. The left monstrosity is more perfectly developed. It is round, with ten or twelve buds situated in different parts of the crown joined together.

Fig. 2 shows a perfect piece of mechanism. In place of the lateral incisor is a molar tooth with cusps and separate roots recognized by the depression at the bifurcation at the gingival margin. The molar has pushed the right central and lateral to the right, causing the cuspid to erupt in the vault. The cusps are very sharp and the sulci deep in the bicuspid and molars, thus showing an imperfect development throughout. These freaks of nature are the result of some disturbances in the development of tissue as early as the third or fourth week of fetal life. It may be due to direct inheritance or to idiopathic influential elements of one or both parents.

THE PAST AND PRESENT IN DENTISTRY.

BY C. N. PEIRCE, D.D.S., PHILADELPHIA.

It has been stated that the evolution of languages, regarded as a psychological process, is largely determined by social conditions.

The following inquiry seems pertinent: Is there a profession, an industry, an enterprise of any kind affecting the human family that has been so shackled, so embarrassed, so handicapped by social conditions as the profession of dentistry? Compare its position with that of the obstetrician, the ophthalmologist, the laryngologist, or, indeed, any specialty of medicine; socially it is in the shade. Is the limited education possessed by the masses in the profession an important factor in this? Or is it the occupation itself which places a stigma upon the character of a dentist regardless of other conditions? It has been said by a prominent dentist that within the limits of the dental profession there are men so skilled in medicine and the arts that, were those pursuing the latter stricken with paralysis and the former disabled by accident, their ranks could be so quickly filled by members of the dental profession that the ripple upon the wave of society would be but temporary indeed. However this may be, there are those in the profession whose intelligence and education should be a passport admitting wherever they desired, without question or comment. Believing in evolutionary processes, and that dental education in its development is not unlike other growths, its votaries have been persistent in their efforts to

advance its status from the simple to the complex, from the elementary to the scientific; yet there have been periods in this progressive stage that may be denominated as expressions of degeneracy. Of these we will speak later on.

A hasty glance at the condition of dentistry and dental education fifty or seventy-five years ago, and a comparison with its condition forty or more years later, or at a more recent period, will demonstrate the marvellous change.

In early times an applicant for instruction was charged a fee, the amount of which was in an inverse ratio to the time to be spent in obtaining the desired information. Six hundred dollars for three months, or two hundred for twelve, was not an unusual fee demanded and paid.

The value to the prospective dentist of this economy in time was almost without price, for in a few months his fortune was supposed to be secured. Nor could the preceptor be more jealous and careful regarding the character of the one to whom he was intrusting the secrets of his laboratory and admitting to his office to watch the movements of both patient and operator. The result of this care brought men of character into the profession.

In 1846, when the first dental college opened for the reception of students, it was regarded with but little favor by those whose annual income had been materially augmented by fees given for private instruction. In order that the college should enjoy the patronage of a sufficient number of students to pay interest on the outlay and necessary expenses, it was quite incumbent on those conducting the enterprise that very limited requirements in anatomy, physiology, and chemistry should be exacted, and also limit in time required to obtain a degree and an attesting parchment. But, limited as it was, it was an advance in the opportunity offered for thorough, honest teaching in the practical branches,—operative and prosthetic. One important element, however, was eliminated,—the personal contact with and the influence of teacher upon pupil.

Within six years from the establishment of the first school, with fifty students in attendance, three were in successful operation, with a patronage of a little more than two hundred students in the three. In 1870 five schools had been established, their combined classes numbering but about, or less than, three hundred students, while in 1896 the country enjoyed the disgrace, shall I say, of fifty-eight dental schools, with over six thousand five hundred (6500) names on their matriculating lists.

That one or more schools with centres and agents for the sale

and distribution of diplomas have been established in this country is a well-recognized fact, but it must be remembered that these have only been in response to the demand for a parchment giving the holder thereof the right to practise dentistry. Hundreds of these unearned documents have been distributed over this as well as the various countries of Europe, thereby increasing the number of charlatans in the profession, and helping not a little to sink it into that slough of despair and degradation in which it is now involved.

It was the activity of this villanous practice that led the dental profession to seek regeneration and protection in State examining boards. These were to be the "antitoxin,"—the source of redemption; much was anticipated, hoped for, by many sincere and able men in the profession. Before making the inquiry as to the extent of the remedy secured from these examining boards and the realization of the hopes of their originators, let me pay a well-merited tribute to the integrity, honesty, and singleness of purpose of the professors and teachers conducting many of our schools. Men more devoted, more earnest in their advocacy of, and in their efforts for, the advancement of the dental profession are not to be found. This is well illustrated in the adoption as rapidly as possible of a broader curriculum, an increased length of each session, and an addition to the number of sessions required before a candidate for graduation could be admitted to final examination. This speaks emphatically for such schools, and demonstrates the purpose of the faculties in charge.

In recurring now to the inquiry regarding examining boards: Have they given satisfactory evidence of a due appreciation of their responsible position? Has their influence been for the protection and encouragement of the best schools? Are the men composing the boards as well versed in the science and art of dentistry as the professors in the best schools? Have they given evidence of any better, or as great an interest in the advancement of the profession? Are they men of equal scientific attainments, or of a higher, unswerving moral character? These are pertinent questions. What the profession—the higher element in it—has a right to demand is that competent, conscientious teachers shall be protected against charlatanism in any form, and that proficient students, recent graduates, well educated in all departments, shall be dealt with justly,—shall be relieved of a rivalry with the ignorant and unscrupulous. The truly professional men, and teachers, are discouraged, not to say utterly disheartened, at the commercial spirit

which pervades educational institutions to-day. The atmosphere of barter and sale infests the class-room, and high ideals in the pursuit of a chosen profession are not encouragingly present in the majority of students.

In a dental school the recital of a practical case, or the description of a manipulative process, has every ear and eye; not a word or movement to be lost. But the origin of a structure, the etiology of a disease, the evolution of a form,—not having a fee apparent or prospective,—is a matter of inattention and indifference.

Have the examining boards tended to remedy this evil? Have they encouraged the student to ideals? Do they estimate the value of well-grounded principles and urge to proficiency in such? Or, are they not, at least some of them, burdened with the same commercial spirit, seeing no value in anything save possessed of an earning capacity?

The position of a critic is an unpleasant one, but when devoid of personality or malice may stimulate to improved conditions.

A student having completed *only the first year's course in college*, after an examination by a State dental board, received the following certificate:

"It gives me great pleasure to inform you that your examination before the Board was satisfactory in every respect, and I have been instructed to express to you the appreciation of the members of the Examining Board as to the high standard of the work which showed such careful and thorough preparation on your part, and at the same time to congratulate you on the fact of your being the first applicant who has come up under (*the five years' clause*) our present arrangement who has passed the examination at his first examination. We wish you the greatest success in the profession you have entered under such favorable auspices."

(Signed by Secretary of the Examining Board.)

This certificate naturally led the holder to believe it insured entrance into the senior class, and for that purpose was presented to the dean. This application was positively refused, but that the applicant might also be convinced of unfitness for such promotion was asked to submit to an examination in physiology, after which the request was not repeated.

A graduate of more than usual merit, having received a diploma, which was shown to an examining board, passed before said board all examinations satisfactorily, at least was so informed by a mem-

ber thereof, who also extended personal congratulations, and requested a friend to write a letter to the successful individual "expressing in complimentary terms the satisfaction given the board."

A few days subsequent to the *personal interview* and reception of congratulatory letter, imagine the young man's surprise at receiving the following from the Secretary of the Board :

"DEAR SIR,—I regret to inform you that your examination before the Examining Board was not satisfactory, and it will be necessary for you to refrain from practising dentistry in the State. You will have an opportunity for a re-examination."

(Signed by Secretary of the Board.)

(Date in July.)

This correspondence was shown to a man of prominence, an ex-representative, and three days thereafter the applicant received the necessary certificate, and without another examination or waiting four months for it.

These facts are certainly evidence of the absence of any fixed principles, or of a settled policy on the part of the board to advance the status of the profession or of dental education.

Moral. Were personal considerations a factor in the above cases? Evidence of dishonesty or degeneracy are always painful to recall and record, but unless some steps are taken to check this downward tendency and avert its consequences, dental education will be greatly impeded and the position of the profession a travesty, a burlesque, on a scientific pursuit.

THE METHOD OF USING SOFT GOLD-FOIL AS PRACTISED AND TAUGHT BY DR. DUNNING.¹

BY CHARLES O. KIMBALL, M.D., NEW YORK.

Our profession stands upon the border-land between science and art, on the one hand seeking to know and on the other striving to do.

So her votaries must be clear of eye and steady of hand as well as close in observation and careful in judgment. Hence it is not amiss that we are asked to give attention for a little while to certain minute details in the use of one of the various filling-materials.

¹ Read before The New York Institute of Stomatology, February 1, 1898.

Without taking time for a prolonged discussion of the fundamental principles of filling teeth, it may be well to briefly state two.

First. That a good filling must exclude moisture from the tooth.

Second. That it must be able to resist the wear of mastication to its very edge.

And while I am not asked to argue for soft gold at all, it may be well to show why it may be wisely used, the reason being found in one word,—“adaptation.” Just as we use a soft cork when we wish to stop a bottle tightly, or lead to fasten iron pipes together, so the soft gold, adapting itself readily to every minute inequality of the cavity, will perfectly exclude moisture, while it may be packed so firmly that it will resist wear as well as the enamel of the tooth itself.

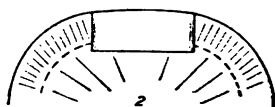
The method of using soft gold-foil which I am asked to demonstrate is often called by the name of Dr. Dunning, who, taking various suggestions from Drs. Lovejoy, Rich, and others, combined them into the system which he employed till his retirement from active practice about twenty-five years ago.

The essential feature of the method consists of the packing of small pledgets of soft gold-foil against the walls of the cavity so that the structure of the filling shall be of thin plates or laminæ, extending from the bottom to the top of the cavity, usually parallel to its walls, but always perpendicular to the surface of the tooth (Fig. 1), by the means of instruments so shaped that they may

FIG. 1.



FIG. 2.



exert their pressure towards each of the walls in turn, including the bottom of the cavity, and yet without tearing the pledgets or destroying the laminæ of the filling.

For reasons which may be explained farther on, the cavities for which this method is best adapted are the small ones on the approximal surfaces of the teeth at the point of contact, and those in the fissures of the molar and bicuspid teeth, together with the cavities along the margin of the gum on the buccal side of the same teeth.

For large operations where one wall of a simple cavity has disappeared leaving a compound cavity, partly on one and partly on another face of the tooth, this method is not particularly well adapted, though in many such cases it may be used with success.

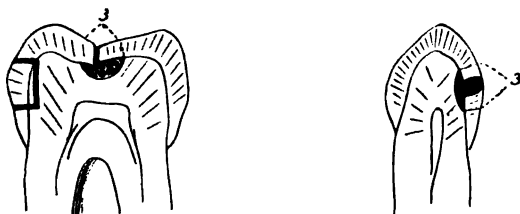
For the still larger operations, where, for instance, one entire angle of a molar tooth has been destroyed with one or more of the cusps, the method is not at all well adapted.

We are concerned with (a) the cavity, (b) the gold, (c) the instruments for packing it, and (d) the manner of using them.

(a) The cavity is prepared with as nearly perpendicular walls as possible, rounding out angles and carefully avoiding deep undercuts, the ideal shape being that of a shallow pill-box (Fig. 2), following as far as possible the natural cleavage of the enamel, thus preventing the chipping of the edge under the strain of filling, and leaving the gold and tooth in the best shape for polishing.

If the decay has undermined the enamel at the edge of the cavity, it is usually best to chip the enamel back till its cleavage is over the edge of the sound dentine (Fig. 3).

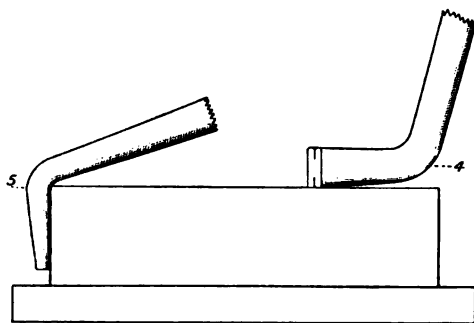
FIG. 3.



The instruments by which this is done are the ordinary "hatchets" and "hoes," but in order to get a perpendicular side and a clean square edge we take an ordinary hatchet and grind its front face (Fig. 4) so that it cuts with its edges; the hoe is treated on

FIG. 5.

FIG. 4.



the inner face (Fig. 5) in the same way. By these two used alternately we can follow round the cavity (Fig. 6).

Of course, there are other instruments used, but these two used in this way are particularly helpful in making the walls of approximal cavities perpendicular to the surface.

FIG. 6.

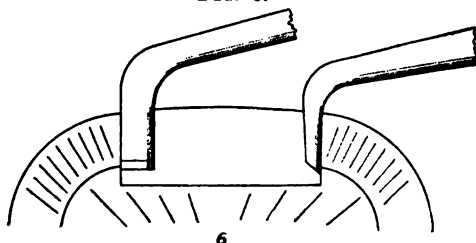
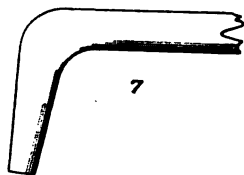


FIG 7.



Approximal cavities require for their treatment by this method separation of the teeth by wedges or otherwise, so that the surface of the filling may be reached for condensation and finishing after it is inserted.

(b) The gold, which should be as soft as possible, is rolled or folded in pellets, of a size proportioned to the cavity to be filled, their diameter being about once and a half or twice the depth of the cavity.

Their density is directly proportioned to the strength of the walls of the cavity, for frail walls softer pieces being used.

(c) The instruments are shaped like a square truncated pyramid bent at various angles and of various sizes, the most useful being those nearly at right angles with the handle (Fig. 7), and those about forty-five degrees with the handle (Fig. 8). The size for each cavity is such that the blade reaches to the bottom of the cavity without the handle touching the edge, but without having much to spare (Fig. 9). They should be tempered so as to neither bend nor break,

FIG. 8.

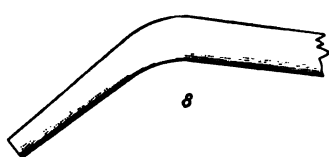
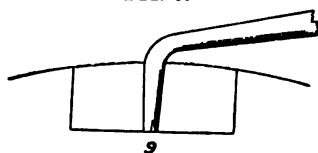


FIG. 9.



though it is better to have them break than to bend. The faces should be smooth and polished, the angles very sharp, and the little terminal face or facet exactly square with the point and sharp on every angle. For condensing, the same instruments are often used, but more frequently smaller ones are required (Fig. 10), somewhat more abrupt in their taper, shorter in length, and smaller in the ter-

minal facet. There should be also a very small round plugging bur cut fine, with round and roughened handle, tempered like a plugger to spring to its point.

FIG. 10.



(d) The manner of packing is to press a pellet of gold of suitable size firmly against the wall of the cavity, most distant from the hand of the operator usually, with the side or end face of the instrument (Fig. 11), holding it in place by a second instrument held in

FIG. 11.

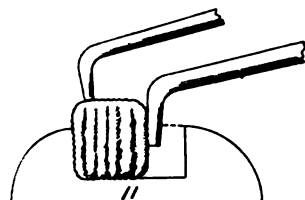
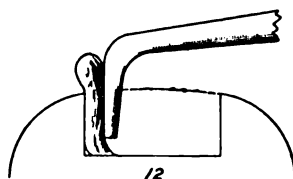


FIG. 12.



the left hand, or by an adroit catching of the pellet in the wall of the cavity, and then packing it firmly against the wall by repeated thrusts of the instrument, making the pressure always towards the walls and perpendicular to them, while the blade of the instrument is parallel to them. This tends to press the gold into a flattened mass tight against the side of the cavity, reaching to the top in an unbroken sheet (Fig. 12), bulging out a little above the edge, but solid from bottom to top. To this another piece is added, changing slightly the direction of the pressure so that it is still perpendicular to the wall but at another point (Fig. 13), but packing with great

FIG. 13.

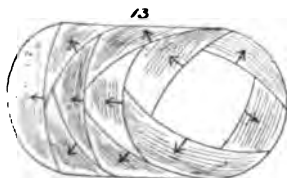
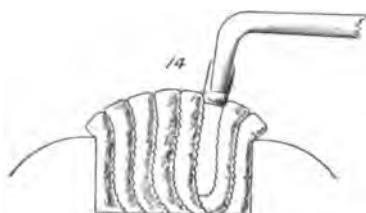


FIG. 14.



care, not leaving any piece until it is packed as hard as possible, or as hard as may be best. This process is repeated gradually, also

reducing the size of the pellets as the cavity remaining unfilled becomes smaller, until it is reduced in size to a mere pit near the centre of the original cavity, or rather nearer one end or side; this is then filled with smaller pellets, using the flattened point of the instrument or a smaller one (Fig. 14). Now, if the process has been thoroughly done the gold should be quite solidly packed, of a fairly even texture, no softer at the bottom than the top, but still too soft to leave a good or safe surface. Next comes the

Condensing.—The filling is pressed by the flattened point of the instrument or by one having a smaller truncation (Fig. 15), working the gold solidly into the cavity. It is then rolled with a plug-

FIG. 15.

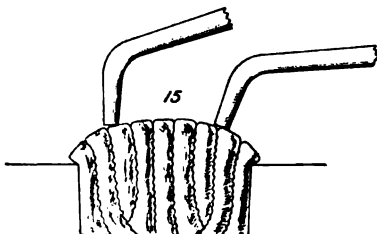
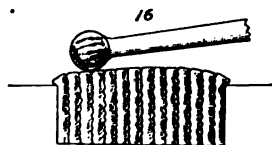


FIG. 16.



ging bur, which is a round-handled, fine-cut bur of very small size, but tempered like a plugger (Fig. 16), and burnished with a small ball-shaped burnisher to condense the surface, and finally is finished off with knife, file, corundum, pumice-stone, and rotten-stone till the surface of the filling and the tooth are continuous.

Such a filling is well adapted for a grinding surface because the gold will never flake off; it is like a pavement of thin gold blocks laid on edge, each holding the other in place. It is also good for a small approximal cavity, because the instrument works equally well in all directions, and so will pack towards or from the operator's hand.

Abstracts and Translations.

IODOFORM SUBSTITUTES.

IODOFORM contains about twenty-nine parts of pure iodine in thirty. Its antiseptic and deodorizing effect is, therefore, due to this element; the carbon and hydrogen with which it is associated render the iodine non-irritant, either when taken by the mouth or

applied topically. A great disadvantage attending the use of iodoform is its disagreeable odor. It is impossible to entirely mask this odor, although it may be covered to a great extent by mixing it with various aromatic substances, such as balsam of Peru, Tonquin bean, coumarin, menthol, thymol, oil of sassafras, attar of roses, oil of peppermint, oil of anise, oil of eucalyptus, carbolic acid, etc. A number of iodoform substitutes have been introduced, some containing iodine, and hence supposed to act like iodoform, and others with no iodine in their composition, but which have a similar action to iodoform. Many of these substitutes are proprietary articles of German origin. The results of inquiries made at hospitals, of pharmacists, and of wholesale chemists and druggists, show that these iodoform substitutes have in no way diminished the use of iodoform, and that, in fact, they are in very small demand.

Iodol (tetra-iodo-pyrrol) stands at the head of the list of iodoform substitutes as regards the amount of iodine present. It contains about twenty-seven parts in thirty. Iodol is obtained by precipitating pyrrol with iodo-iodate of potassium. It is a micro-crystalline, brownish-white powder, having a faint thyme-like smell, and is soluble in six parts of absolute alcohol, but nearly insoluble in water. It is said to produce no toxic action like iodoform when wounds are dressed with it, and its application is painless. Iodol has been used with good results in granular and chronic conjunctivitis, hard and soft chancres, and various ulcers much improve under its use. It possesses some anæsthetic action, and acts as an astringent when discharge is copious.

Iosophan (meta-tri-iodo-cresol) contains twenty-four parts of pure iodine in thirty. It is a grayish crystalline powder, soluble in alcohol, chloroform, oils, and fats. It has been found useful in parasite skin-affections, but not of general value, and it is apt to cause irritation.

Iodo-salicylic acid and di-iodo-salicylic acid are iodine compounds of salicylic acid in which one or two atoms of hydrogen respectively are replaced by iodine. Di-iodo-salicylic acid contains twenty parts of iodine in thirty, iodo-salicylic acid fifteen in thirty. These compounds are powerful antiseptics. They possess the combined action of iodine and salicylic acid, and have been successful in the treatment of acute polyarticular rheumatism where salicylates have failed. These acids are in the form of white micro-crystalline powders, slightly soluble in water, soluble in alcohol, ether, fixed oils, and, like salicylic acid, also in collodion.

Soziodol (di-iodo-para-phenolsulphonic acid) is composed of

fifty-four per cent. iodine, seven per cent. sulphur, and twenty per cent. phenol. It has been combined with sodium, potassium, ammonium, lead, mercury, and zinc, which have been suggested as odorless substitutes for iodoform. The sodium salt which has been used is in colorless shining acicular crystals, soluble in water. The salt is well tolerated as an external application. It has been given internally in doses of twenty grains three times a day. Soziodol has been found useful in the treatment of whooping-cough,—three grains blown into each nostril once daily. A solution of soziodol-mercury with iodide of sodium has been recommended for intramuscular injection in syphilis.

Aristol (di-thymol-iodide) is a reddish-brown powder containing 45.8 per cent. of iodine. It is insoluble in water, glycerin, or alcohol, but soluble in ether or oils. It has been used successfully in various skin-affections, psoriasis, eczema, rhinitis, ozæna, and lupus, but has proved unsatisfactory in lichen rubra, soft chancre, and gonorrhœa. Aristol has a certain effect on venereal ulcers, but acts very slowly; the only advantage it possesses over iodoform is absence of smell; its activity is inferior. It has been found of service in the first and second stages of pulmonary tuberculosis when no cavities exist. It also lessens cough and night-sweats. Burns and scalds have been successfully treated with aristol, and the application in a powder to the cornea in keratitis and in an ointment in corneal ulcers has given good results. It is of great value in nasal affections; it lessens the discharge, relieves pain, and stops bleeding when used as an insufflation in cancer of cervix uteri.

Europhen (iso-butyl-ortho-cresyl-iodide) occurs as a pale-orange, non-crystalline powder, containing twenty-eight per cent. of iodine. It possesses powerful antiseptic properties, and, being resinous to the touch, it adheres well to mucous membrane and wound surface, and does not easily cake. A given weight as compared with iodoform will cover a surface five times the area of the latter. It is non-poisonous, and acts only when brought into contact with secreting surfaces, which decompose it and liberate iodine. Its lightness and freedom from odor make it especially useful in dentistry. The general opinion of europhen is that it may be used with advantage in all cases where iodoform has been used. Improvement has followed its use by inunction and subcutaneous injection in tubercular leprosy, and it has been found serviceable in eye-diseases, otitis, and ozæna. Europhen has failed in eczema, psoriasis, and gonorrhœa, but has given satisfactory results in sim-

ple and venereal ulcers, and in oily solution injected daily for syphilis.

Loretin (meta-iodo-ortho-oxy-chinolin-ana-sulphonic acid) is a bright-yellow, crystalline powder, odorless, and similar in appearance to iodoform. It is very slightly soluble in water or alcohol, and insoluble in ether, but forms soluble salts with alkalies, except with lime. It is non-poisonous and unirritating, and has been used with marked curative effect on burns, ulcers, and other wounds.

Airol, a gallate of bismuth and iodine, is a light grayish-green powder, stable in dry air, but, when left in contact with moisture, iodine is gradually liberated. It is insoluble in water, alcohol, and ether. Airol is astringent and desiccative, as well as being antiseptic.

Di-iodoform (ethylene periodide) occurs in yellow crystals, almost inodorous, insoluble in water, soluble in chloroform, and slightly in alcohol and ether. It is partly decomposed by light. It has been recommended as an antiseptic in place of iodoform.

Antiseptol (iodosulphate of cinchonine) is an odorous brown powder, which has been recommended as a substitute for iodoform. It contains half its weight of iodine, and is soluble in alcohol or chloroform, but is insoluble in water.

The chief non-iodine compounds which have been introduced to compete with iodoform as an antiseptic are dermatol, thioform, and thioresorcin.

Dermatol as a basic gallate of bismuth is recommended as a powerful non-irritant antiseptic and desiccant. Applied to wounds, it induces rapid cicatrization, does not irritate, nor give rise to toxic effects. It is not well suited to septic wounds, and insufficiently stimulating in chronic indolent ulcers. It is a quicker microbicide than iodoform. Its use in the treatment of venereal ulcers has been successful, and also in pustular and diphtherial conjunctivitis, corneal ulcers, and pannus, but of little use in blepharitis. Dermatol is a yellow powder, odorless, and insoluble in water.

Thioform, a basic bismuth salt of di-thio-salicylic acid, is a yellowish-brown powder, odorless, and insoluble in water. Its claim to supplant iodoform is based upon its freedom both from odor and from toxic properties, its greater antiseptic strength, and its desiccative action. It freely absorbs secretions from wounds without forming a crust. As a desiccant antiseptic, especially for eye cases, it has been recommended.

Thioresorcin is a combination of sulphur with resorcin. It is a yellowish-white, inodorous, and non-toxic powder, insoluble in

water, slightly so in alcohol and ether. As a dusting-powder, it has been used instead of iodoform, and a ten- to twenty-per-cent. ointment for eczema, psoriasis, and other skin-diseases.—*British Medical Journal.*

LIQUEFIED ATMOSPHERIC AIR.

Now and again, of late years, the scientific journals have referred to liquid air,—that is, atmospheric air so condensed as to assume the liquid form. The possibility of this, as a laboratory experiment, has long been demonstrated; but the conditions required to bring it about were so exacting that, until very recently, it has been a curio of the physical laboratory. Heretofore an extremely low temperature, difficult and costly to secure, has been employed in producing liquefied air; the cost is said to have been about twenty-five hundred dollars a quart, and the quantity obtained so small that its peculiar properties could be but imperfectly examined.

Very recently, Mr. Charles E. Tripler, of New York, has solved the problem of producing cheaply and on a commercial scale liquefied atmospheric air by an ingenious and simple process. The product is as yet too new to permit an estimate of its possible usefulness.

Mr. Tripler first, by ordinary means, condenses the air to a pressure of two thousand pounds to the square inch. This he permits to flow through and around a copper worm, and through an opening the size of a fine needle. It expands as it issues from this orifice, and cools very considerably. This cooled air is passed through another coil, which cools it to a still lower temperature, and, escaping, it passes through a third coil, which cools it down to below minus 191° Centigrade, or 320° below zero by the Fahrenheit scale. It runs out of this third coil in a liquid stream as large as the finger, without any pressure at all. This extremely low temperature is produced entirely by the expansion of the air itself.

On Thursday, January 27, 1898, Dr. Barker received at his laboratory at the University of Pennsylvania, from New York, a "milk-can" full of this liquefied air, and before an interested audience demonstrated some of its physical properties. It was the first time, indeed, that any opportunity had been offered to exhibit this interesting product so freely. Heretofore liquefied air has been confined in strong steel cylinders, under heavy pressure, or in glass

tubes kept at an extremely low temperature, and in very small quantities. In this case, two and a half gallons, which were used in the demonstration, were brought from New York in a common milk-can, packed with felt, and with a protecting air-space, but were not under pressure.

Dr. Barker, in explaining the principles which lie at the base of this discovery, said, "Matter exists in three states,—solid, liquid, and gaseous,—dependent upon its temperature, pressure, and consequent volume. Compress a gas and it becomes denser; but so long as it remains a gas it is not converted into a liquid. If we condense a vapor it becomes a liquid by pressure at a given temperature. The doctor illustrated this by reference to water in a receiver exhausted of air. The water evaporates and fills the receiver with vapor, and there is then liquid and vapor there in the presence of each other. If heated, the amount of vapor will increase. The boiling-point of water is 100°C . If the water is heated to that point, the pressure of vapor in that receiver is just equal to the barometric pressure. If the temperature is raised above that point, the water boils and becomes vapor; at that point it remains liquid. Applying that principle to the air, which is already in a gaseous state, imagine a point where it is on the balance, as in the above example, where a lowering of temperature makes it a liquid and a rise of temperature makes it gaseous. That point is a temperature of minus 191°C ., or, by the Fahrenheit scale, 320° below zero.

"At this point air liquefies and remains a liquid at barometric pressure the same as water. If raised above that temperature, as by standing open to the atmosphere, it evaporates, the evaporation tending to keep it cool, so that a tumblerful of the liquid would all evaporate in about half an hour. Nitrogen liquefies at minus 193°C . and oxygen at minus 180°C . It is evident, therefore, that, as the liquid becomes warmer, the nitrogen will pass off into the gaseous state, leaving a greater portion of oxygen behind to evaporate at a still higher temperature. It thus follows that, in time, the liquid becomes principally oxygen; this is shown by the bluish color which it gradually assumes after standing open awhile."

The doctor then proceeded to experiment with this new form of air, showing some of its peculiar properties. When first poured into a tumbler, the liquid would boil until the glass had cooled down. This was because any rise of temperature above minus 191°C . would, as before described, raise the liquid above its boiling-point. Any substance whatever dipped into the liquid had the same effect, and made it boil. Its vapor coming in contact with

the air cooled the moisture in the air, which fell down in a cloud of hoar frost. A piece of tin, also a piece of flexible rubber tube, thrust into the liquid, became quite brittle. Neither copper nor platinum were at all affected. Alcohol was frozen into a solid chunk by pouring a quantity into the liquid; mercury was frozen solid by pouring some of the liquid upon it, and was then used to drive a nail into a piece of hard wood. A taper, extinguished, but having a spark on its end, broke into a brilliant flame when placed over the liquid, showing the presence of the evaporating oxygen at its surface. Many other experiments were performed, which kept the audience in a state of breathless wonder, not only at what they saw, but at the possibilities which may soon become realities in the economic use of this new form of air.

W. H. T.

Reports of Society Meetings.

THE NEW YORK INSTITUTE OF STOMATOLOGY.

A REGULAR meeting of the Institute was held Tuesday evening, February 1, 1898, at the office of Dr. Charles O. Kimball, 27 West Thirty-eight Street, New York City, the President, Dr. E. A. Bogue, in the chair.

The minutes of the previous meeting were read and approved.

The President.—Our fellow-member, Dr. George S. Allan, has consented to bring before us this evening a paper upon the use of hydrogen dioxide in its different strengths in the treatment of pulpless teeth.

(For Dr. Allan's paper, see page 201.)

The President.—Discussion of Dr. Allan's paper is now in order. Gentlemen present who are not members of the Institute will please consider that they are cordially invited to join in the discussion.

Dr. S. C. G. Watkins.—I would like to ask Dr. Allan one or two questions. He showed us how he would dip the piece of cotton into pyrozone, allowing the ether to evaporate, pure H_2O_2 , remaining on the cotton. I would like to ask him how long that would remain in a root with putrescent contents without becoming offensive or losing its power.

Dr. Allan.—That is a question I could not answer; it would depend entirely upon the relative amounts of hydrogen dioxide and putrefying substances in the pulp-chamber. If there were a surplus of the H_2O_2 , of course there would be no putrefaction whatever.

Dr. Watkins.—I would also ask if, in treating deciduous teeth, Dr. Allan would carry the cotton into the canals and allow it to remain there.

Dr. Allan.—I would carry the cotton into the canal only while treating a tooth; that is to say, my whole object would be to get the roots of the tooth in an aseptic condition, pure and healthy, and all germs of putrefaction removed. I would not attempt to fill them, but would close the open ends of the roots with gutta-percha, which seems to be about the best material, first using some varnish to keep germs out of the dentinal tubules.

Dr. Watkins.—After bleaching teeth with pyrozone, does Dr. Allan protect them with any kind of varnish before filling?

Dr. Allan.—Yes; I use cavatine of the S. S. White Company. I do not know what it is made of, but it seems to me to be effective. Anything of that kind is useful to a great degree in keeping germs from entering the tubules.

Dr. L. L. Howell.—If Dr. Allan opened into a tooth containing a putrescent pulp, would he apply the hydrogen dioxide in full strength before he removed the pulp?

Dr. Allan.—I think under those circumstances it would be a very good plan to employ the three-per-cent. solution cautiously, to do away with the offensive odor and the annoyance of handling a pulp in that condition. The sulphuric acid treatment, introduced by Dr. Callahan, affords a very valuable method of treating putrescent pulps. I know of nothing that gives better results than the sulphuric acid and soda treatment, but in the ordinary operations of treating dead teeth my plan is to open them as carefully as possible, syringe them out with warm water first and then with pyrozone, not attempting to put in cotton or in any way induce pressure towards the end of the root. After washing the root out as well as possible, I put in a very loose pledget of cotton with borolyptol, oil of wintergreen, or some similar preparation upon it. After a while the fluid contents of the pulp-chamber and roots should be drawn off with small rolls of absorbent paper, and a loose pledget of cotton soaked in some strong germicide should then be sealed up in the cavity. I think Dr. Howe made some remarks about this method of treating pulpless teeth a few years

ago We should always be very careful not to force any of the contents of a putrescent root through the foramen, and it takes very little pressure to do it.

Dr. Watkins.—When would Dr. Allan use the twenty-five-per-cent. solution of hydrogen dioxide?

Dr. Allan.—Not in a living tooth, and not in a dead one until the foramen had been completely closed. If we use the ethereal preparations of H_2O_2 in a dead tooth without first sealing the foramen, we will have many reasons to regret our lack of caution. We can use the three-per-cent. aqueous solution of pyrozone with a great deal more freedom, but even with that the best practice is to seal up the foramen.

Dr. W. St. George Elliott.—A great many prominent men in the profession have advocated the use of cataphoresis in bleaching teeth, and a good many of us have met with considerable success. I am not at all surprised that Dr. Allan failed. I am rather surprised that any of us have ever met with success, because we have always used the wrong pole of the battery; we have used the positive pole when we should have used the negative, and our success has been owing to the pyrozone and not to cataphoresis. The younger members of the profession have no idea of the position they are in now as compared with those who entered the profession many years ago. Of course we know that antiseptic surgery is a modern idea. We attribute it largely to Mr. Joseph Lister, now Sir Joseph Lister, a personal acquaintance of mine whom I esteem very highly. His introduction of the system, while it was original so far as he was concerned, was very quickly abandoned for more simple means. It happened to be my fortune at one time to be a surgeon in the army; I had charge of the Ninth Army Corps Hospital, with many wounded. We had an enormous amount of gangrene and gangrenous trouble of every kind. We had great difficulty in treating it, and had to resort to pure bromine, nitric acid, etc. In those days it was impossible to open the joints without serious results. There were always adhesions, and a stiff joint resulted. Mr. Lister told me that in his first experience he met with that difficulty, but by the use of the antiseptic spray he got rid of it. "Now," I said, "please tell me what is the strength of the carbolic acid that you use." He answered, "Three per cent." I asked, "Will three per cent. destroy micro-organisms?" "No," he answered. Since that time the advance has been such that we have abandoned the spray and gone into the use of antiseptics, and have now even commenced to abandon antiseptics. I was at an

operation in the Johns Hopkins Hospital some time ago, and in talking to Dr. Halstead asked him what was the present status of antiseptics in surgery. He replied, "They are a good thing, but they are by no means a necessity; for two years we have run this hospital without the use of any antiseptics whatever, and with perfect success; but it is a great deal easier to use antiseptics than to take the extra precaution of great cleanliness which is otherwise necessary."

Dr. J. Morgan Howe.—I would like to ask Dr. Allan how he washes out the root, with a syringe, or by swabbing the canal, or by some other method?

Dr. Allan.—I wash it out by swabbing, taking a very little cotton, so that no pressure is required. With a fine needle wrapped with a few fibres of cotton, pyrozone can be forced well down into most of the larger roots, the eye-teeth or the large molars; but to do effective work it should be carried down on a little broach, always looking out not to have too much cotton.

The President.—We are to consider the use of pyrozone uncalled for until after the foramen shall have been sealed?

Dr. Allan.—It may be used very cautiously, but only the three-per-cent. aqueous solution.

The President.—The discussion being closed, we will now hear from Dr. S. C. G. Watkins, of Montclair.

Dr. S. C. G. Watkins.—The Institute's Executive Committee having been kind enough to ask me to tell what I know about xeroform, I gladly comply. This is one of the new preparations, which with many operators takes the place of iodoform. I have a few points here which I will read and then give a little experience.

Xeroform, tribromphenol-bismuth, is a new preparation, to take the place of iodoform. It is a very fine greenish-yellow powder, almost odorless and non-irritating. It is very soothing and healing in its effects, and will reduce pus secretions very rapidly, in fact, more rapidly than almost anything I have used. It will promote new granulations and cicatrizations more quickly than most remedies. It is recommended for stopping hemorrhage; is also said to allay pain in cases of burns; it is lighter than iodoform, and does not require as much to spread over a surface. Another strong point in its favor is that it is non-poisonous and can be administered in large doses internally.

The reports from hospital and general practice demonstrate conclusively that xeroform is not to be ranked with many of the so-called substitutes for iodoform, but it is a substance having all the

best qualities of that drug in an enhanced degree without its disadvantages, as also a number of other valuable properties that iodoform does not possess. The following comparison shows this plainly:

IODOFORM.	XEROFORM.
Poisonous.	Absolutely non-poisonous.
Marked and persistent odor.	Practically odorless.
Causes eczema.	Never causes eczema.
	Free from germs.
Very feeble action upon bacteria.	Very powerful action upon bacteria.
Not sterilizable in its ordinary form.	Sterilizable by simple heating.

I wrote to the importers, asking them how it compared with iodoform as an antiseptic, and they sent me the following statement and comparison. Dr. W. Schmidt, of the University of Berne, made a series of very thorough comparative experiments to determine the bactericide value of a number of the more recently introduced powdered antiseptics. I will quote from his report the following results of the tests, which were made with anthrax cultures, which, as is well known, are considered the most resistant micro-organisms:

"PER CENT. IN MEDIUM.

Per Cent.	First Day.	Second Day.	Third Day.
Xeroform . .5.	Diminished growth.	Diminished growth.	Diminished growth.
Xeroform . 1.	Diminished growth.	Diminished growth.	Diminished growth.
Xeroform . 2.	Death.	Death.	Death.
Xeroform . 5.	Death.	Death.	Death.
Iodoform . .5.	Growth.	Growth.	Growth.
Iodoform . 1.	Growth.	Growth.	Growth.
Iodoform . 2.	Growth.	Growth.	Growth.
Iodoform . 5.	Growth.	Growth.	Growth."

Xeroform is insoluble in water, alcohol, vegetable oils, fluid vaseline, and chloroform. It is soluble in two per cent. hydrochloric acid, in the proportion of thirty to one hundred.

I have been using it for several months with most marked success, in cases of pulp-canals, in all conditions, giving one treatment and allowing it to remain indefinitely.

I will state a few cases, so that my hearers can see in what way I have been making use of it. In July, just before I went on my vacation, a gentleman called with a second superior bicuspid, crown nearly gone. The canal was decayed and really in a bad state of putrefaction, and the man was suffering from periostitis. I cleansed the canal, pumped in xeroform with a liquid antiseptic, stopped it up with cotton, sealed the cavity with gutta-percha, and went away

on my vacation. At the end of eight weeks the patient returned to have further work done. I removed the cotton, which I found to be clean and the xeroform apparently without any deterioration. He stated that he had had no pain after the one treatment. I will say here that that is my general practice. I rarely treat a canal more than once, but in nearly all cases I cleanse the canal as near to the end of the root as I can, syringe it well with some antiseptic, and then pump the xeroform, in connection with some antiseptic, into the canal and stop it up with cotton and sandarac. I always expect to fill at the second sitting, generally giving about ten days between the sittings.

Another case. A gentleman called about a month ago with an abscess which had formed at the end of the palatine root of the right superior wisdom-tooth. I opened the canal and carried the medicine to the end of the root, and then opened the abscess in the roof of the mouth. I filled the canal with xeroform and oil of cinnamon and a rope of cotton, and sealed the cavity with cotton and sandarac. I then washed out the abscess with a two-per-cent. solution of trikresol, then placed a goodly quantity of the xeroform in the abscess cavity, and carried a rope of cotton into the cavity, and allowed it to remain. He came in the second day after that for further treatment, and on removing the cotton, the xeroform was dry and apparently clean. There was still some soreness, and I opened the abscess cavity a little deeper, getting a drop of pus, then washed it out, and carried the xeroform into it the second time. After two days I repeated the operation, and by that time it had almost healed, so that I did not treat it again. The cavity had nearly filled with new granulations, and in the course of a few days was entirely well.

There was a case of a lady who had a spot of eczema on the face, about the size of a cent, that had been there for a long time and had resisted treatment. I gave her a little vial of borolyptol and one of xeroform and asked her to apply them alternately. The borolyptol simply as an antiseptic wash to wet the surface so that the xeroform powder would adhere. She applied them frequently, and at the end of a couple of weeks the spot had almost disappeared.

I also had a case of eczema on the hand, which had been troubling the patient for about a year; there were two cracks forming a cross, which would bleed slightly at every bend of the hand. One Saturday night I bandaged it, first wetting the parts with borolyptol and then placing the xeroform upon it. I treated

it again Sunday morning, and again on Sunday night, and on Monday night it was entirely healed, and there has been no return of it.

I also had a case of a man who had torn his wrist badly, among the tendons, on a rusty wire nail in a salt mackerel barrel. He paid no attention to it, and I did not see it for a week after the accident. At that time it was in bad condition, having a greenish cast and was sloughing. I washed it carefully, using a two-per-cent. solution of trikresol, and then applied the xeroform, dressing it once a day. In the course of two or three days a marked change was noticeable, new granulations formed around the outer side, and it went along and healed very nicely.

I have also used xeroform some on chafed lips in my own case, quickly healing them.

About two weeks ago a gentleman, seventy-nine years of age, called with a swollen face from a superior cuspid. I opened the tooth and the pus ran out freely. I syringed the canal thoroughly with trikresol and then pumped the xeroform into it, sealing it with wax over a rope of cotton. He returned at the end of ten days, and I filled the tooth permanently. I have done away with the use of iodoform, and I feel that xeroform is more reliable. I have been better satisfied with it than with anything else I have used to take the place of iodoform.

Dr. J. G. Palmer.—I would like to ask Dr. Watkins with regard to the case just before he went on his vacation, and also in the case of the gentleman seventy-nine years of age, why he should use both trikresol and xeroform if the latter has all the valuable features that are claimed for it. How does he know that xeroform did the work?

Dr. Watkins.—I used the trikresol as a carrying medium to make a base for the xeroform powder; trikresol is a good antiseptic, but, like other things of the kind, when it is shut up in a tooth for a time it loses its strength, and the tooth would need further treatment, whereas in connection with xeroform the one treatment is sufficient. I think it would make no difference how long xeroform was left in a canal; if left a year, I think the canal would be found to be perfectly aseptic at the end of that time.

Dr. Benjamin Lord.—I would like to ask Dr. Watkins what he would fill the canal with.

Dr. Watkins.—With gutta-percha.

Dr. Lord.—Dissolved gutta-percha?

Dr. Watkins.—No; little cones softened by heat and carried to the ends of the roots.

The President.—There are quite a number of substances similar

to the one of which Dr. Watkins speaks. They belong to the group which comprises iodine, carbolic acid, creosote, and their derivatives. Carbolic acid, as is well known, is divisible into cresylic and phenic acids. The substance under discussion this evening is of the phenic acid group, and has been mostly used among the Germans. I have a pamphlet in my hand describing three of these compounds: betanaphthol-bismuth, phenol-bismuth, and tribromophenol-bismuth, all of which act, as is supposed, by splitting up into their component parts, the principal one of which is phenic acid, and this in turn does the work of antisepticizing the territory under treatment.

They are designed, as Dr. Watkins says, to take the place of iodoform, which, besides having a most offensive odor, is poisonous under certain conditions, and produces, when its systemic action is felt, loss of appetite, giddiness, and other unpleasant symptoms.

Iodoform is supposed to act by eliminating iodine, which is its active principle; but in xeroform the active principle is phenol.

Dr. Heuss explains that when xeroform is placed upon the skin with its acid reaction the drug is inert; that it is only when in contact with the living alkaline tissue fluids or with the mucous membrane that it becomes useful.

To obtain the fullest and quickest action from xeroform all sloughs, bits of coagulated blood, pus, and scales must be removed, and the powder applied directly to the surface of the wound; and it is only under these conditions that the division into parts takes place, the bismuth acting as a covering, while the phenol does its work, but so gradually that it is no longer toxic, as it would be if applied directly.

In France a substance called traumatol or iodocresine is used precisely as xeroform is recommended to be used.

Traumatol has as its basis cresylic acid in place of phenic, and it is thought by those who advocate its use that, as cresylic acid is in some respects probably the most powerful antiseptic known, it will prove to be the long-desired and much-hoped-for dressing for open wounds.

I have quite an account here of syphilitic cases treated with xeroform successfully, acting upon the principles given above.

I was hoping that Dr. Watkins would give us something more accurate in regard to the treatment of a closed root of a tooth, for, judging from the description which these little pamphlets give, we should have pretty nearly a stoppage of the pulp-canals in which xeroform might be placed.

How the action of xeroform can be differentiated from the action of the trikresol, with which it was mixed by Dr. Watkins, he fails to tell us.

If there is nothing further upon this point, we shall expect to see and listen to the demonstrations and explanations of Drs. Kimball and Lord in using soft gold.

Dr. C. O. Kimball.—I am afraid that I shall seem somewhat puerile in the elementary things which I have to bring before you, and yet after reading to one of our friends what I intended to say on the subject, and giving him a similar demonstration to that which I wish to give to you, I asked him if I were not too childish, and he said, "On the contrary, I wish for my sake that you would make it still more elementary, calling attention to the finer points of the work." That must be my excuse for offering a few words and a demonstration out of the mouth upon a method which some of us have practised for a great many years, and which is in its main features well known to all present.

Dr. Kimball then gave a demonstration of his method of preparing soft gold, and filled a cavity in a tooth out of the mouth, explaining meanwhile the details of the operation.

(For Dr. Kimball's paper, see page 211.)

The President.—Dr. Lord requested me to say that he regretted the necessity of going home at this hour, but that he would hold himself in readiness on a future occasion to speak on the subject.

Adjourned.

S. E. DAVENPORT, D.D.S., M.D.S.,
Editor The New York Institute of Stomatology.

ACADEMY OF STOMATOLOGY.

A REGULAR meeting of the Academy of Stomatology was held on Tuesday evening, December 28, 1897, at 1731 Chestnut Street, with the President, Professor Edwin T. Darby, in the chair.

A paper on "Syphilitic Affections of the Mouth" was read by Dr. H. H. Burchard.

(For Dr. Burchard's paper, see page 162.)

The President.—The subject is now open for discussion, and a very interesting subject it is. I am sure that any practitioner of any number of years' standing has met in mouths, where he least expected it, the manifestation of syphilitic virus, and it behooves

the dentist, above all men, to be constantly on the lookout for just this condition of things.

I am very glad that Dr. Burchard has called attention to the distinction between syphilitic teeth and atrophied or imperfectly developed teeth. They are very frequently mistaken. I frequently have patients brought to me with what are purported to be syphilitic teeth, when they are nothing more nor less than these imperfectly developed teeth, consequent upon some insufficiency in nutrition.

The paper is now open for discussion.

DISCUSSION.

Dr. E. C. Kirk.—Mr. Chairman, I wish first to express my appreciation of the very clear presentation that Dr. Burchard has made of this very interesting subject. I wish especially to commend his drawings illustrating the several lesions which he has described, and, further, incidentally to call attention to the very great desirability of having drawings of this character made by a dentist. I think they are the first drawings of this character, either anatomical or pathological, in which the human teeth have been represented as human teeth. They evidently bear the impress of a man who knows something of tooth-formation. They show that they were drawn by a dentist.

My first professional acquaintance with syphilis occurred, I think, in 1877, in listening to a lecture on this subject by the late Professor Agnew; and I was impressed at that time with the very great importance of the ability in the practitioner to recognize the characteristic features of syphilitic lesions, especially because of the necessity for protecting one's self and one's patients from the horrible results which might occur from any mistake in regard to diagnosis in this matter. Later on, when I took dental lectures, the subject was again impressed upon my mind, and I think that, as a graduate, I left college fully impressed with the great importance of recognizing these conditions. But as I went on in practice I found very few cases, and in looking back over perhaps twenty years of experience in contact with people of all sorts and conditions, the number of syphilitic lesions that I have observed in the mouth has been remarkably few. I made a sufficiently careful study of the subject to be able to recognize secondary, tertiary, and primary manifestations of this disease in the mouth; but, as I say, the cases that have come to me have been extremely few in proportion to many other disorders, much less

than I had anticipated from the instruction I received at college and the feeling that I had absorbed in regard to it.

I have seen a number of cases of secondary lesions in the mouth, and they have been sufficiently described by the essayist. I think we could all remember cases of this character. The same with the tertiary lesions.

It was my good fortune at one time—and only one time in my career—to meet with a primary syphilitic lesion in the mouth; the case was of peculiar interest to me. It has never been reported, and I am glad of the opportunity to report it this evening. There was a necrotic patch or area just above the gingival margin of the upper left cuspid tooth, just as though a half-rounded chisel had cut out the gum tissue and left a base which was clay-colored, having the general characteristics of a mucous patch, but the edges were indurated. There was no pain to speak of, and no other lesion of the soft tissues of the mouth, but on examination I found a marked induration of some of the submaxillary and cervical lymphatics. The condition had existed for about ten days. Because of the peculiar appearance of the necrotic patch, because of the history of the case, because of its general clinical characteristics, and because of the induration of the lymphatic glands, I suspected that it might be a case of primary chancre. It was not complete; it was crescentic in character, not fully rounded, but looked as if infection had taken place at the gingival margin, and because of its location of circumference could not be completed. I dismissed the case for the time being, sent for the gentleman who referred the case to me, and asked him, if possible, to endeavor to ascertain the previous history. The girl told me that she had injured this gum-tissue with a tooth-brush, and this sore followed. I learned afterwards that while she was employed as a domestic in a boarding-house she had utilized the tooth-brush of one of the boarders to perform her dental toilet, and, as he was suffering from secondary syphilitic lesions of the mouth, the virus had been conveyed in that way. It is the only case of primary syphilis of the mouth I have ever seen, and was interesting because of its history and the method of transmission.

We are instructed (as we have been in the paper this evening) as to the especial care necessary to protect not only our patients, but ourselves, from syphilitic infection in the use of instruments. I heartily agree with all that the essayist has said as to the necessity for the sterilization of instruments and the maintenance of an aseptic condition of everything that goes into the mouth; and it seems

hardly necessary to emphasize that, because it is presumable that the general principles of antiseptic surgery should apply to all dental operations without regard to their specifically infectious character.

The question, however, of the contagiousness of syphilis is one that has interested me greatly. I have on two occasions, in operating for syphilitic patients where the lesions of the secondary stage existed, by accident subjected myself to the chances of infection, and have been caused a great deal of subsequent anxiety because of the possibility of personal infection. On one occasion I wounded my index-finger with a plugger-point, and thought I was certainly infected with syphilis, but by careful sterilization of the wound, and by promotion of free bleeding at the time, no ill results followed.

On another occasion, in scaling the tooth of a patient whose mouth was affected with mucous patches, a particle of tartar sprang out of the mouth, passed beneath my glasses, and struck the sclerotic. I washed out the eye with warm water, and never had any difficulty. I am not immune from this disorder, but it shows that syphilis is not as contagious as it may have been considered; and, as a matter of fact, I think Dr. John Musser (of the University of Pennsylvania) within two or three years has written an essay on this particular point, showing that there is ground for belief that the type of syphilitic infection in later years has undergone considerable modification, that is to say, it is not as virulent as it was in its earlier history. How far that is true, I do not know.

As to the question of tertiary lesions of syphilis from a practical point of view, a case was referred to me recently of tertiary syphilis, with perforation of the hard and soft palate, not involving the distal border of the velum, but simply a large oval area of the hard and soft palate. The case was referred to me at the University, with the request that an obturator or an appliance be made to close this opening, in order that the patient might be able to masticate food and swallow better. I found that the edges of this opening were very much indurated, that the disease was still in an active state, that the inflammatory process was still active, that there was quite a considerable amount of bleeding from the margins of the opening, and from the fact that a flat obturator introduced under these circumstances would be in itself an irritant, I advised a postponement of mechanical treatment of the spot until the tissues could be brought to a more healthy condition. I felt sure of my ground at the time, but in thinking it over I have thought perhaps

I might have been in error, and that the temporary closing of the orifice might have aided in the process of healing by relieving the tissues from irritation by food substances taken into the mouth. I would be very glad to have the judgment of my colleagues as to whether an obturator ought to have been inserted or postponed, as I advised, until the tissues were well.

Dr. M. H. Cryer.—I would like to thank Dr. Burchard for his paper, and to ask him a question as to whether the teeth on the lower row in the drawing were not caused by salivation before the formation of enamel. In regard to Dr. Kirk's question, as to inserting an obturator before the orifice was healed, I should certainly not recommend it. No matter how carefully constructed, it would be an irritant. The exudations from this sore would be conveyed to other portions in contact with the mucous membrane. I should much prefer deferring the placing of the obturator until the tissues were in better condition.

Dr. H. B. Roberts.—I would like to ask Dr. Burchard if it is possible for syphilis of the mouth to continue for periods running into years without destructive processes going on afterwards. I had as a patient a child that I believed to be syphilitic—born so; it is now nearly twelve years old, has never been able to talk intelligently, cannot walk without assistance, and its mouth seemed almost a mass of white mucous patches, located first at one place, then at another. The child was under my care for three or four years; she always came in with the same condition, and yet there was never any destruction of the tissues other than the mucous patches.

The only other case that I came across was that of tertiary syphilis with an ulcer half-way through the tongue. I had not suspected syphilis. I referred him to a physician, and he afterwards came back again with his tongue in a more healthy condition, following the use of iodides.

The President.—We have with us this evening a gentleman from the medical profession in the person of Dr. Schamberg. I am sure the Society will be glad to hear from him.

Dr. J. F. Schamberg.—If I may be permitted to make a few remarks, I will preface them by thanking Dr. Burchard for his very admirable paper, and by stating that I would endorse *in toto* all the remarks he has made.

There can be no doubt whatsoever as to the importance of syphilis in relation to dental surgery. The disease is so widespread that many cases must of necessity come to the hands of the dentist, and particularly now, inasmuch as it is the custom of

physicians who are treating cases of syphilis to send them, immediately upon the recognition of the disease, to a dentist for the purpose of putting the mouth into proper shape.

We are aware of the fact that caries of the teeth and stumps in the mouth predispose to oral conditions in syphilis, to mucous patches, and other forms of syphilitic infection, and therefore dentists will be very apt to have cases of this nature come under their charge.

In the early stages of syphilis the disease is greatly contagious; and I may add here that it is not only contagious when there are certain lesions in the mouth, such as the initial lesions, chancre, and mucous patches, but it is contagious through the saliva when there are no oral lesions. I believe that the view of eminent syphilographers is that the virus of the secretions of the body in the second or constitutional stage of syphilis is infective, the tears, the saliva, very often the secretions of the stomach, and others. Therefore, even though there be no lesions whatsoever in the mouth, there is a possibility of infection, and the very practical point that this brings up is the thorough sterilization of all dental instruments after treatment not only of suspicious mouths, but of all mouths, because no one knows whether it is a syphilitic mouth he is treating or not. There are many cases of syphilis to-day going about without any cutaneous manifestations whatever, without any systemic or oral manifestations, and yet they are just as capable of transmitting this disease as if they were covered with these lesions.

Syphilis is a protean disease, manifesting itself in various ways, and Dr. Burchard has well illustrated the chief types of this disease, as well as its relation to the mouth.

I can state, in relation to Hutchinson's teeth, that Mr. Hutchinson says that the characteristic Hutchinsonian teeth are the upper central incisors. When other teeth are infected, they may be syphilitic teeth, but they are not pathognomonic; and the features are that crescentic excavation upon the free border of the tooth, the discoloration of the tooth, and, shortly, what he calls the "pegged-shape" tooth. The free border is of much less breadth than the gingival or alveolar border.

As regards the secondary patches of the mouth, they are very commonly confounded with lesions of this cavity. A great many skin affections, such as herpes and other disorders, always have concomitant lesions in the mouth, and herpes soon breaks down, the covering rupturing and exposing to view a small reddish abrasion, which may be readily mistaken for a mucous patch. However,

this matter of diagnosis is not of vital interest to the dentist, inasmuch as the question is, Shall he sterilize or exert any particular care or not?

In the tertiary lesions of syphilis of the mouth we have the gummata and what results therefrom,—the deep ulcers; and it may be stated in general that the tertiary lesions of syphilis differ from the secondary in their deeper destruction; they destroy more and go more deeply, involving not only the submucous tissue, but also the bone and cartilage. In connection with these ulcers, one may lead to other ulcers in the mouth. There are epithelioma and tubercular ulcers, and I will say that it is extremely hard to differentiate them.

Syphilis is an extremely important disease, and I should like to correct any impression that may exist as to its infrequency. It is a very frequent disease, and, it may be stated advisedly, that it is just as frequent in high social stations as it is in low, not only abroad, but in this country, and almost every day dentists are bound to have patients come into their offices who have or have had syphilis.

An oral difference which may come under notice of the dentist is the peculiar whitish discoloration of the tongue or buccal mucous membrane; it is termed leucoplakia buccalis, or mucous plaques, and other varieties; some have been termed para-syphilitic. They are not due directly to syphilis, but to the ulterior influences of this disease. They are in many cases due to an irritation of the stomach, and this is perhaps the most frequent form. There is a form of syphilis which people have had in which a precedent syphilis has had some etiological influence.

I thank the Society for the courtesy extended to me in permitting me to make these remarks.

Dr. J. H. Gaskill.—I would like to ask Dr. Burchard a question. I had a case of syphilitic origin which involved the pharyngeal muscles, the soft and hard palate, the nasal bones, and a portion of the maxillary bones. The bones of the nose and a portion of the maxillary bone had to be removed, allowing the soft tissues of the nose to fall in, and making the face very flat. This allowed the end of the nose to point upward, elongating the nostrils and giving the patient so bad a deformity of the face that I have made him a false nose. I would like to ask whether there is a possibility of the irritation from the attachment of that nose inducing a trouble of another kind. To get a firm hold for that artificial substitute, I have made hard-rubber prolongations into the nostrils, and also

passed a hook back of the lip; the upper part is held in place by spectacle frames.

Dr. H. H. Burchard.—The answers to Dr. Kirk's and Dr. Gaskill's remarks both come under one head. The conditions they describe belong to the lesions of tertiary syphilis. Where these tertiary lesions of syphilis are present they are regarded as a local disease. They have this peculiarity, that they are locally infective, have a disposition to travel, and run a phagedenic course, and it is with extreme difficulty that they can be checked. So that in relation to Dr. Kirk's case, where the lesions are only partially healed, I deem it advisable to defer prosthesis until the healing is completed, after a course of iodide.

In Dr. Gaskill's case, the degree of pressure permissible depends largely upon the thoroughness of the eradication of syphilis. There is always danger of precipitating degenerations in syphilitic tissues, so that I should say, be guarded in the amount of pressure and its kind for a long period. Certainly, if the patient had any evidence of syphilis remaining, there would be danger of deep breaking down of the tissue caused by this kind of irritation.

In regard to Dr. Cryer's question as to whether the Hutchinson teeth, or the other types of teeth shown here, could be caused by mercury or not, the best evidence in this matter is that of Hutchinson himself. It is a curious thing that, while during this time the upper central and all of the incisors are in process of formation, these two teeth, as a rule, should be the only ones affected. In mercurial cases all these teeth are affected,—for example, when half the crowns of the upper central incisors are affected, about one-third the crowns of the lateral incisors and the tips of the cuspids are affected, and a large portion of the lower incisors. But in syphilis the pathognomonic teeth are the upper central incisors; the lower incisors may be perfectly normal. That is usually regarded as the point of differentiation between the two. In syphilitic children who have had a course of mercury, the teeth often show evidence of faulty enamel formation; they have deep transverse grooves running across the crown, but these teeth show no evidence of gross malformation.

Dr. Roberts's question I would refer to Dr. Schamberg. In hereditary syphilis, as in this case, the lesions about the mouth would not have come under the head of mucous patches; these latter are fungating ulcers which disappear with the other manifestations of secondary syphilis. It has been maintained that syphilis is a self-limited disease in the sense of having a definite course. If

no mercury were administered during the primary or secondary stage, and if no iodides were administered prior to or during the tertiary stage, then syphilis would run a distinctive course, the mucous patches belonging to the secondary constitutional stage. But as to the question why these ulcers in Dr. Roberts's case persisted, Dr. Schamberg will furnish him the answer.

Dr. J. F. Schamberg.—I should state that at times, in syphilitic individuals, even the administration of the iodides of mercury would not be sufficient to dissipate any lesions of that disease, provided there was marked malnutrition. At times the so-called therapeutic test is not worked. And if these ulcers be syphilitic and do not heal, and the patient be under large doses of iodides and mercurials, then he may be classed as belonging to this group, in which the general condition of the patient was such as to fail to give the treatment a proper hold and fail to stimulate the regeneration of the tissues.

INCIDENTS OF PRACTICE.

Dr. Otto E. Inglis.—Under this heading I may report a case which has come to a happy conclusion, in the Philadelphia College clinic, of a young boy about twelve years of age, who tripped in crossing a room and fell against the arm of a chair. In that fall he knocked out three of the inferior incisor teeth, which remained out two days before he came to the college. Those teeth were prepared and sterilized according to instructions generally given for replantation; the sockets were enlarged, and the teeth replanted and ligated with a simple ligature of silk. This was done five weeks ago, and at the present time the teeth are quite firm. I do not propose to take off the ligature for two weeks, though they are quite firm without it, as I have tested them.

Dr. H. C. Register.—I had an interesting case that commenced over two years ago,—a lady, who, after being under the care of a physician for perhaps two or three weeks, suffered very intensely with neuralgic pains through the base or occipital portion of the cranium and through her eyes. Getting no relief, she concluded that she would have me examine her teeth. On careful examination, I found the first bicuspid gave some response to a very hot blast of air, but could get no response from any of the other teeth by tapping, by cold water, or by any of the tests I used, with the exception of the blast of hot air. That gave me the impression that there was something unusual the matter with the first bicuspid. I concluded to go into the pulp, and I found that it was

affected with calcification. It was the only positive condition of granular calcification of the pulp that I have ever had in my practice. In breaking up the remainder of the pulp, it was extremely painful, but ultimately I did succeed in doing it, to her entire relief. The pain in her head discontinued, and she was a well woman, and continued so until about two months ago, when she said the same pain was reappearing, more markedly in her eyes than anywhere else. I found by tapping the second bicuspid that a little soreness was present, and upon entering it I found complete calcification of the pulp. I cut until I was afraid I would go into the cementum and alveolus. I did reach nearly the apex, and there I found an infinitesimal portion of pulp matter which was exquisitely sensitive, so that it was with great effort that I succeeded in destroying it. I asked if her eyes had been examined, and she said, "No;" so, remembering what Dr. Garretson had said to us about cataracts, I made a pinhole through a card, and asked her to look through it. She found she could not see a round hole; she saw an oblong hole. I conferred with her husband, and said I thought cataracts were probably forming. She was taken to an oculist, who pronounced that such was the case.

The question is, Is the formation of cataracts of the eye coincident with calcification of the pulp of the tooth, or is there some power at work in the system that has produced one and is producing the other?

Dr. H. H. Burchard.—This is a deeply interesting subject that Dr. Register has just brought up, and if it were not, I would not take up any more time in the discussions. There is a constancy in the reactions occurring from the conditions Dr. Register has described; these pathological conditions of dental pulp belong under the head of deeper degenerations of the pulp, and this reaction is quite characteristic of these conditions; wide-spread reflex neuralgias are also characteristic. Setting aside any differentiation of the several types of deep degenerations, and taking up the question of reflex troubles in the eye alone, they are of extreme interest and importance both to the dentist and general practitioner. There was one case where amblyopia followed upon degenerative changes in the dental pulp. This amblyopia persisted for about twelve years, when a septic pericementitis occurred about the tooth. As soon as this was remedied, the eye condition materially improved, and it grew decidedly worse upon the reappearance of septic infection about the root of the same tooth, and then became better after the tooth was extracted; that is, blindness returned when the vent

for the pus was blocked up, and partially disappeared upon extraction of the tooth.

In regard to the types of these degenerations, we must differentiate between them. The first stage is where there is an exaltation of the formative function of the odontoblasts, resulting in the formation of secondary dentine. In such cases there is no painful reaction, reflex neuralgias do not occur, and no abnormal response. Under the head of secondary dentine, pulp nodules are not to be placed, because it is very rarely that these structures represent the typical dentinal structures. They are formed in the substance of the pulp, and indicate degeneration. It is in these deep degenerations that wide reflex neuralgias are marked.

Hyperæmia of all the pulps of the teeth is very common in conditions of gout, and so is general hyperæmia of the pericementum.

Dr. H. C. Register.—I think this patient is gouty, though I do not know whether she has pyorrhœa.

Dr. H. H. Burchard.—A pulp-stone growing in an abraded tooth may be the cause of vicious neuralgia. If another tooth in another portion of the mouth be extracted, there may be no evidence of caries or abrasion; but on breaking up the tooth, pulp nodules may be found in greater number than in the primarily affected tooth. There seems to be a dyscrasia in that condition. Dr. Cryer handed me a tooth where the pulp had undergone calcareous degeneration, and said this pulp gave such and such symptoms. I said the pulp is nearly obliterated by secondary growth, and that is the condition we found. There is a calcareous degeneration, and there is a deposition of calcareous matter in the pulp, but in these calcareous deposits there is more or less of anatomical form. It is a secretion, not a mere precipitation of calcium salts.

Dr. H. C. Register.—In regard to the calcareous deposits of pulp, there was a very beautiful specimen that presented itself in a patient. I had capped the pulp of a cuspid tooth, and the crown was becoming so discolored that I thought it must be devitalized, and concluded to enter the pulp. But after removing the filling I found that I was cutting secondary dentine, and to such a depth that I concluded that the pulp had become calcified. After passing through quite a stratum, I suddenly plunged into a living pulp. I suppose there must have been quite a number of lines in width of this secondary formation drilled through.

Dr. H. H. Burchard.—You may find secondary dentine deposition on the periphery of the pulp-chamber, and you may find in another portion of the pulp a nodule, evidently formed by secretion,

not by precipitation, and in another portion of the pulp the precipitation of calcareous matter as a secondary degeneration.

Dr. R. Huey.—I had a personal case which was exceedingly interesting to me, inasmuch as it gave me a good deal of suffering and puzzled me. Dr. Cryer will probably be interested in it. I am a sufferer from pyorrhœa, and during the last two weeks I have suffered a great deal with a second bicuspid tooth. Any change of temperature produced excruciating pain. This is the way the tooth looked (illustrating on black-board). The cap was removed, but relief was but slight. The pulp began to die; the symptoms of death of the pulp became evident, so I concluded to have the tooth removed, remove all the pulp, and replant it. I believe one of these days we will find that to be a cure for pyorrhœa alveolaris. I proceeded to remove the pulp through the filling, and in passing into the pulp I noticed a little exudation of discolored lymph about half-way between the neck of the tooth and the apex of the root. I had before diagnosed the deposit of calculus all the way to the apex of the root, but the tooth was firmly attached. The calculus had reached the point where a slight opening occurred at about the middle third of the root, and I wondered if that had been causing the trouble, for I could have gotten up a nice little alveolar abscess.

The President.—You are sure there had been no absorption of the root?

Dr. R. Huey.—There appeared to be perfectly normal foramen to the inside of the tooth, through which there seemed to be circulation; and I am satisfied that no pressure upon the pulp took place at that point. I have the tooth; it is not replanted yet.

The President.—Absorption has taught us that the foramina through which the blood-vessels enter to nourish the tooth are not always at the apex. I apprehend, if we knew the whole truth, we would find that they are frequently not at the apex.

Dr. M. H. Cryer.—At the same time I would state that they do enter the apex.

The President.—Sometimes, but not always. When we try to put a broach through the apex, the broach may go outside, somewhere else.

Dr. M. H. Cryer.—I see how that could occur in this way: the provisional foramen was at the apex (and much cementum has been built on), and the canal deflected, but originally it was at the apex.

The President.—Yes, I have seen that in cases of hypercementosis.

Dr. I. N. Broomell.—That brings up a subject that has been in-

teresting me somewhat of late. In investigations which I have made, I have traced the growth of the tooth from the first deposit of lime-salts up to the formation of the crown. In all these specimens we have surrounding the forming crown the saccular wall. The root has extended in this manner (illustrating) because the saccular wall has extended with it. At this stage we do not have the inferior dental nerve (if you choose to use that term, for example) running up to supply the crown of the tooth. We do not have it when the root is somewhat further formed. The supply is given to a growing tooth from the surrounding (follicular) wall. It has always been a puzzle to me to know at what time this nerve and blood-vessel enter that foramen when the crown is formed.

Dr. E. C. Kirk.—What occupies the central cavity?

Dr. I. N. Broomell.—The central cavity is occupied by dental pulp.

Dr. H. H. Burchard.—The artery and nerves are quite distinct after the fifth month. Take a tooth at the fifth month, and you will find blood-vessels entering the pulp. If you take the follicular wall, you will find blood-vessels entering it, and between these two there is a decided space; but the vessels at the base of the pulp and entering it are marked unmistakably.

Dr. I. N. Broomell.—I am very glad that Dr. Burchard has tried to make the matter plain, but he has not made it plain to me. I have not only tried with the naked eye, but I have tried with a microscope, to find where this blood- and nerve-supply comes off. I know there is a supply of blood-vessels given off.

Dr. H. H. Burchard.—You might not have happened to hit a longitudinal axis of those blood-vessels in that pulp.

Dr. I. N. Broomell.—But after the tooth is fully developed, we have a nerve and blood-vessel entering the foramen.

Dr. H. H. Burchard.—The blood-vessels come in like this (illustrating); Dr. Cryer has shown it. In the early stages of the formation of the jaw the inferior dental artery is of a certain length. As the jaw develops it becomes longer, and at this portion it is ramified (illustrating), until it breaks up into an Haversian system, sending vessels into the pericementum, and these communicate over the external alveolar wall with those of the maxillary periosteum; but in some cases I have no doubt that a vessel may give off branches and run right into the apical space.

Dr. E. C. Kirk.—The nutritive supply is unquestionably in the general papilla which forms the pulp; that should settle the question.

Dr. M. H. Cryer.—Dr. Burchard said I have shown the canals which transmit vessels and nerves to the apical space. I can show the nerve in position in these canals.

The President.—In the inferior dental canal?

Dr. M. H. Cryer.—Yes, and beyond it.

The President.—They are very distinct in the lower animals,—the calf, for instance.

Dr. H. H. Burchard.—The reason the vessels acquire their distinctness at later stages is because the dentine grows in about them and obliterates nearly all the vessels. Where there may be a dozen arteries in the dental pulp at six months, at the time of eruption there may be only two or three. I can demonstrate in sections arteries and nerves lying beneath the formative pulp.

Adjourned.

OTTO E. INGLIS,
Editor Academy of Stomatology.

Editorial.

THE RELATIVE VALUE OF TECHNICAL INSTRUCTION.

WHEN the proceedings of four years of the National School of Dental Technics fell into our hands, it was with the hope that something valuable would be gained through the experience of many teachers in this work, in which all dental educators have a direct interest. In some respects this hope has been fulfilled, but, it must be confessed, not to the extent anticipated.

The report presents to the mind a series of papers, many valuable in suggestive thought and practice, and all tending to make college work of more value than it was in the earlier period of dental education. This effort is worthy of all praise, as all attempts at an honest advance in any calling must ever be, and for this due credit should be given.

The establishment of this association of dental pedagogics—for such it is—began in the needs of the more isolated colleges in the Middle West, and has found its most ardent supporters in that region. The reason for this is not difficult to determine, it having been the result of an increasing difficulty in keeping the growing numbers of students fully occupied during the scholastic term.

Many of the schools had been established in sections not well adapted to a large patronage of patients suitable for clinical instruction, and the paucity of these forced the teachers to other methods, and an increase of time to permit their full development.

The question that interests the writer of this is not how much may be added to the curriculum, but how thoroughly that which is already engrafted upon our best colleges is taught. It is an axiom in education, as well as in other things, to "make haste slowly," and time must be given to test all methods before resorting to others the value of which remains an undetermined quantity. The effort to make dentists practically equal to doctors of medicine has led to overcrowding the curricula of all the schools to an extent that the most earnest teachers are seriously asking the question, "How is it possible that all this can be accomplished in three years?" The answer simply is, It cannot be. When due consideration is given the subjects usually taught in the best-arranged dental colleges, the mind shrinks appalled at the outlook, and no intelligent educator dares to expect that the student can, or will, be able to take more than a superficial view of the whole as a basis for his future work in the greater world of which he is to form a part. It may be said that this is true of all education. This is admitted, but it is certainly essential that the untrained student should absorb to a large degree the practical as well as the collateral theoretical branches of his profession. To accomplish this, time must be given for thorough digestion of basic principles of the entire curriculum.

This necessity in a student's experience leads up to the thought, Why spend so much time in the non-essentials sought to be inculcated in the articles and discussions laid before us by this association? To the mind of the writer, some of these are too elementary to deserve a place in the proceedings of a body of educators such as this.

Young men enter college to acquire there a profession which is peculiar, in that it combines, as no other, a certain amount of mechanical ability with a knowledge of the human organism but little less than that demanded of medical graduates. The first effort, therefore, must be to discover if that which is primarily important exists latent in the mind of the student, a talent for mechanics, the foundation work of dentistry. If this be not present in the individual, time is more than wasted in the endeavor to make him or her a dentist. In order to discover this, the student should be placed upon a work that will fully demonstrate it, and there is no

better method than to start him upon metal plates in the laboratory. The manipulation of rubber will not meet this want, and yet it is upon this that colleges generally place the student of the first year. That this will not give any clear idea of the trend of mind must be apparent to the most superficial observer. In connection with this the freshmen year is largely occupied in acquiring knowledge of form by drawings, mouldings, and in printing silhouette impressions of canals. Now, it may be asked in all seriousness, Is this essential? Form may be recognized by one having a talent for drawing from the model, but to one who has it not it is, in the writer's opinion, a useless expenditure of valuable hours, while, at the same time, it fails as an indicator of the student's possible ability as a mechanician. The knowledge of form gradually grows upon the mind by daily observation of natural teeth in the course of clinical practice, and that with a positiveness that time cannot efface. The filing of teeth to secure a correct idea of the form of pulp-canals is necessary and should be obligatory, but after that is done, of what use to the student will be the silhouette pictures of the same canals? About as valuable as it would be for the student, over the cadaver, to make a drawing of every muscle dissected.

A certain amount of this preliminary work is necessary, but it must be brought, in every case, as near to the future requirements of the student as possible. It is therefore thought to be a mistake to give students the work of forming cavities in bone, and carving wood, moulding in clay, or carving soap to represent teeth. This method of instruction recalls the case of a student, familiar to the writer, who began the study of dentistry with a German practitioner. He placed the young aspirant for a dental education upon carving teeth out of ivory, and kept him at this work for six months. When asked, "Do you make teeth of ivory now?" he replied, "No, but you must acquire manipulative skill, and this is the best way to accomplish it."

The statement is made that the dental colleges that adopted a graded technical course were very few prior to 1893, and all those mentioned were in the West. This is an error and should be corrected as a matter of history. The school with which the writer is most familiar had for many years prior to this a graded course in technical instruction, and this continues to the present day, omitting non-essentials. When this was established it was supposed to be a part of good teaching and not worthy of special notice, and not at variance to that followed by all well-regulated schools. It

comes, therefore, in the nature of a surprise to find that so many colleges were deficient in this personal preliminary supervision work. If this technic association has accomplished nothing more than inducing the schools to better methods, it will have justified its existence for the time being.

In the Eastern schools and, possibly, in all schools situated in large centres of population the demand for dental service is largely in excess of the ability of the students to perform, requiring frequently engagements several weeks in advance. The fact is recognized, it is presumed, that the so-called dummy practice stands in no relation, as regards value, to the practice on the living body. This being so, it is vitally important that, after fundamental principles are engrafted upon the mind, students should be given charge of patients with as little delay as possible. It is a grave mistake, in the writer's judgment, to practically omit this until the third year of pupilage. It is no marvel that some men go out of their respective colleges not as well prepared as they should be to assume the grave responsibilities they are sure to meet. If colleges cannot secure the living subjects for mechanical, operative, and pathological practice for students, then as dental educational institutions they have no right to exist, for the clinic is the vital point in this character of instruction, and without it dentistry cannot be taught.

There are many collateral subjects to which the student's attention should be called, but until more time is given to training than we now have—three years—these must be relegated to the future. What we most need is a higher, but not too high, entrance standard, and then thorough work in every branch allotted to our care. This requires large means, ample building room, perfect appliances, and, above all, *teachers* in the highest and best sense, and this, it is presumed, will be the most difficult problem to surmount in the future, as it is in the present.

THE SOUTHERN BRANCH OF THE NATIONAL DENTAL ASSOCIATION.

THIS will, hereafter, be the name by which the Southern Dental Association will be known, at least this is the title as given by a correspondent of the *American Dental Weekly*.

The meeting was held at St. Augustine in February, and was, according to the same authority, a great success in point of numbers.

The papers presented were in excess of the time of three sessions a day and three days' work, and many were simply read by title.

Florida seems not to have come up to expectations as a State for conventions, for the correspondent remarks, "We are sure that the society has agreed unanimously that we will not go there again."

The success of this meeting, the first since the organization of the National Association, demonstrates the wisdom of continuing it as a branch and the folly of destroying the American Dental Association. This body could have been used as the Eastern Branch with equally good results.

An attempt is being made to organize a new body in the Eastern States, an effort involving great labor and an unnecessary waste of mental strength, but inasmuch as the past cannot be recalled, an organization similar to the Southern seems imperatively to be demanded.

THE REVIVAL OF BAD METHODS.

ATTENTION is specially called to the article by Professor C. N. Peirce, entitled "The Past and Present in Dentistry," and particularly to that portion giving facts in relation to the action of a certain board of examiners in passing, with effusive compliments, a student in attendance at a college in the freshman year.

This board has been very pronounced in its efforts to raise (?) the standard of dental education, so much so that it has proposed to turn down all colleges that decline to come up to its standard. The facts as stated by Professor Peirce will enable the dental profession to come to correct conclusions.

If this were the only board guilty of this it might be passed over, but it is well known that it is not exceptional, though, possibly, more offensive than some others.

The National Association of Dental Faculties in 1884 did away, it was supposed forever, with the right to graduate on five years' practice. That it has come to be revived by a board of examiners will be a positive shock to the dental educators of the country, and should open their eyes to future possibilities of evil, in connection with college work, through the maladministration of law.

LIQUID AIR.

THE article of our correspondent, W. H. T., on another page of this number, gives an interesting report of a lecture delivered by Professor George F. Barker, of the University of Pennsylvania, upon this new product obtained through the original method of Mr. Charles E. Tripler, of New York.

The report of this lecture created an intense curiosity in all circles, and great pressure was brought upon Professor Barker to have it repeated.

The writer had the pleasure of being present at this second lecture, March 14, and it is needless to say he held the interest of a closely packed audience from the beginning to the close.

The novelty of seeing air dipped up by a ladle from a can, not unlike, from outside appearance, to a milk-can, was rather astonishing to the auditors. The can resembled an ice-cream freezer in appearance. The inner can contained the fluid air, and between this and the outside can, heavy felt was packed.

The experiments which followed were all intended to show the intense degree of cold produced by the liquid air. Paraffine, when immersed in it, became in a few moments as white and as brittle as chalk. Rubber tubing was made as friable as glass. Tin would be affected similarly, but no effect was produced on copper. Beef-steak and an onion were frozen so thoroughly that they were readily crushed between the fingers. The familiar experiments with oxygen were repeated, showing the power of fluid air to support combustion. Mercury was frozen so hard that it became malleable under the hammer, and solid enough to drive a nail in a board.

While liquid air is not a new product, it has heretofore been produced only in small quantities, and at such great cost that it remained simply a scientific fact. Whether the certainty that it can be produced in unlimited quantities will make it of commercial value remains to be seen, but no doubt such will be the result.

That this production of liquefied air is one of the most interesting facts in modern science remains without dispute and it will no doubt soon be seen in all scientific educational circles, and like the Röntgen ray become common knowledge and, perhaps, like it, of equally practical value.

Bibliography.

A TREATISE ON IRREGULARITIES OF THE TEETH AND THEIR CORRECTION. Including, with the Author's Practice, other Current Methods. Designed for Practitioners and Students. Illustrated with nearly Two Thousand Engravings (not embracing the Classification of Mechanism in third volume). By John Nutting Farrar, M.D., D.D.S., Esq., Graduate of Jefferson Medical College, Pa., and of Pennsylvania College of Dental Surgery; Member of New York Medical Society, etc. Volume II. London, New York, Leipsic: Published by International News Company.

It is rare that a reviewer, in the dental profession, is called upon to take up the examination of a book of this magnitude and one offering so many complex conditions for study. The fact that it presents over eight hundred pages and about seven hundred and fifty illustrations is sufficient indication that a superficial glance and a hasty judgment would not only be an injustice to the author, but would be equally an injury to the intelligence of the dental profession, which this work is intended to educate. An effort, therefore, has been made to examine it thoroughly, and the results might be summed up in a few words, that it stands unrivalled in profuseness of illustration and clearness of scientific statement.

The first volume deals largely with theories and principles, and the second with cases which cover a "reproduction of a mass of classified notes covering a practice of about a quarter of a century."

The author says in his "Prefatory Remarks" that "throughout the Treatise conservatism in everything has been the intention. By conservatism I do not mean 'old fogyism.' The teachings are strictly confined within scientific limits,—a range which, if understood, is intended to enable the progressive student to accomplish the best results in the easiest way with the least inconvenience to the operator and patient. . . . Effort also has been made to show in diagnosis and prognosis the distinction between that which *ought* and that which *ought not* to be attempted and that which *can* and that which *cannot* be done and that which is *possible* and that which is *best* to do."

In regard to classification the author further says, "The order of classification was mainly governed by the location of the deformity, those in the upper arch being considered before those in the lower and the anterior teeth before the posterior. For illustration the upper incisors are considered first, the cuspids next, then the bicusps, and lastly the molars. After these the teeth of the lower jaw are considered in the same order."

The author has but little faith in teaching principles in the abstract, and asserts that it is his belief "that there can be no clear understanding of principles except through clear knowledge of details." In this he simply follows the method of the true teacher, and of which Agassiz was so strenuous an advocate, that a student must master the thing itself in all its details independent of books, principles, or technical terms. The mistake is too often made in considering all these as primarily important, relegating details to future experience. It seems, therefore, to the writer that the author founded his work on the truest principle of teaching as it is understood by the most successful educators.

In Chapter LXXI. the author details his "Philosophy and Esthetics and Theory upon Regulating Teeth." This is an interesting chapter, and should be carefully studied by the beginner in this branch of practice.

The truthfulness of the following proposition cannot be controverted and should be engraved upon every mind that first essays the moving of teeth: "If the tissue-changes can be conducted within the physiological functions, the operation of moving a tooth will be painless; but if the rate of changes be pushed beyond this condition, into the pathological, there will be more or less pain," and the author might have added, possible permanent injury to the tooth. This embodies the fundamental principle upon which the work is based, if the reviewer understands the author, and it is for this mainly that the practice so thoroughly commends itself to him. It must be a recognized fact that a tooth moved continuously and rapidly means not only destruction of surrounding tissues in their physiological relations, but a possible disturbance of function beyond the return to normality, or, in other words, a determination in the direction of the force applied that ends eventually in the very irregularity it is sought to overcome. Aside from this, it may mean devitalizing of the central organ, the pulp. Intermittent force is then the true force, periods of motion and periods of rest.

While this is true and advocated with the usual vigor of the author, he by no means confines his work to those appliances that

give this intermitting force, the screw for example, but makes use of springs, rubber bands, strings, etc., where these may be safely used. It is an error, and it is thought one generally entertained, that the author repudiates all force except that which he has termed the "positive." The very opposite of this view will be exemplified in almost every chapter; in fact, the proper use of mixed appliances advocated, it is surmised, will be a revelation to some who have persistently held an opposite opinion of his work.

Criticism has been made that the author's illustrations are pen-and-ink sketches, and are not æsthetic and do not compare favorably with ordinary wood-cut engravings. This seems to the writer a very superficial view. The object of all illustrations is to render the text so clear that no mistake may be made in the author's meaning, and in the present case to enable the practitioner to follow it and manufacture the appliance exactly as represented. The illustrations drawn by him meet, beyond cavil, this demand. They are drawn with great exactness, every screw being clearly defined and the course of every thread or rubber ring so marked that the tyro can unerringly follow the course of procedure and the direction which the tooth is supposed to take. The marked difference between these illustrations, following the pen-and-ink drawings by the author, and those engraved in the usual way is plainly evident when these occur. For instance, on page 1473 an engraving is given illustrating the elevation of a cuspid by a gold mechanism. It is extremely difficult here to discover what the picture is intended to convey, and it certainly does not make the text clear. Compare this, and the one on the following page, with several in the same chapter drawn by the author and upon the same subject, and it will be clearly evident that what may be gained picturesquely by the usual wood-engraving is lost in clearness of description.

It may seem strange in an author to acknowledge ungrudgingly the merit of laborers in the same field, but it is so often neglected and that to the injury of many, that when it is found that nearly every chapter opens with a description of appliances made by others and a generous praise awarded them where it can be given, it is worthy of special notice. The author not only freely mentions this, but is quite willing to give credit even where an appliance had its origin in his own mind, but had been previously used without his having been aware of the fact. This must necessarily occur where the same train of thought has operated to produce similar mechanical fixtures. The effort to discover similarities in those used at present with those in use in the past

and present century must have entailed very great labor in research. It is this that makes the work cyclopedic.

The experience of the author, covering the practice of many years, has enabled him to illustrate a variety of cases covering all possible irregularities. Fortunately for the student, these are not imaginary cases, but all with the author's sign (A) have been treated to a successful issue by the methods described. The practitioner having a given case has simply to study the teeth and illustration, and then, if so disposed, can carry on the work in the same manner. There are no superfluous words used in the text to obscure meaning. The simplicity of expression is worthy of all praise, especially in the avoidance of technical terms. This is the rock on which most beginners in teaching and writing are wrecked.

The reviewer, in passing over the pages, has found an added interest in the fact that many cases described therein come up on the tablet of memory, as though he were back in the years, endeavoring to answer the question, "How am I to regulate this case?" This query has racked the brain of many, and could these, in the past, have had this clear exemplification of how it could be accomplished, many weary hours spent in study might have been avoided. This is well illustrated in the moving of a cuspid erupting back of the central incisor, pages 1103-1117. This is, perhaps, the most difficult of all teeth to bring into alignment, at least it has given the writer more tedious discouragement than any other. The difficulties met by the author and the methods by which he finally surmounted them is, probably, as instructive as any of the cases described in the book.

Some may be inclined to doubt the possibility of making the appliances which the author describes so minutely. This will, of course, depend on mechanical dexterity. Unfortunately, all will not be equal to the work, for it certainly does require more than ordinary mechanical skill to make and place a fixture such as the writer has had the pleasure of seeing in the mouth of one of the author's patients. The perfection of adaptation and of movement is not to be obtained by indifferent mechanisms. Hence, if the volume had no other object than to illustrate a high standard of excellence, it would have performed a great service to dentistry, but this the author would probably regard as the least of its claims to consideration.

While the author in no case dogmatically assumes to dictate methods, it is evident he has his favorite modes of regulating, and is strongly inclined to the use of the screw wherever it can be ap-

plied. In Chapter CXXVIII., on the "Turning one or more Incisors by Screws," there will be found a number of twisted incisors undergoing regulation with screws placed on the labial surface of the teeth. This may seem to be open to criticism, as placing a disfiguring appliance in full view of all observers. It must be remembered, however, that the mechanisms are drawn to an enlarged scale to show philosophy of action, while in reality they are delicately made and result in slight disfigurement.

It will probably be assumed that a multiplicity of cases would lead to a constant repetition of details. While this is, in a measure, true, the author has avoided, very happily, the monotony of illustration, and has made the book a series of cases in which each leads the student by successive steps from the simple to the complex through new adaptations of force. This is evident from the fact that interest is maintained from the opening chapter to the close, and while it is not a book to read continuously, but rather for study of details, the reader will find himself in a similar position with the reviewer, reading page upon page, each in turn revivifying old experiences and engrafting new ideas for future work.

Space will not permit further elaboration of this review. The two volumes now placed before the dental profession are models of thorough work, and, doubtless, the third volume will continue this to a completion of the author's ideal. The labor devoted to this production may find no remuneration in financial profits, and this is probably not looked for, as this labor of a life is practically a gift to the dental profession and given as an evidence of his devotion to its best interests. With this prominent idea in his mind the author has built up a work that will be for future generations a mine of scientific thought and of practical suggestions. In the reviewer's opinion it will, as the years go by, become more and more not only a work of reference, but its mechanisms will be followed just in proportion as men become more skilful in the use of tools and are able to discover the underlying principles which govern the author's work. These, based on true physiological laws, can never become obsolete, but will gain vigor as the years pass by and a higher standard prevails in dental work.

The book, it is almost needless to add, is a companion to the first volume in every respect, and both are splendid specimens of the printer's art. The author says of this, that he "has presented the work in the size and style of type that would most likely be agreeable to those members of the profession who are obliged to read evenings."

While some who entertain views antagonistic to the author may honestly criticise some things, the writer has failed, as this review demonstrates, to discover anything of vital importance with which he is not in full harmony, and hence gladly gives his full meed of praise, as worthy the subject, treatment, and the man, and it is there left for the verdict of the future.

A very full table of contents and an index of sixty-two pages, double columns, rounds out and completes the book.

The following notice of the same book was forwarded to this journal by Professor C. N. Peirce, and it is appended as part of the review :

In the first volume of this treatise, issued in 1888, embracing fourteen parts, is given a comprehensive consideration of irregularities of the teeth and the theory of their correction, including the principles of mechanism that are necessary for the execution of operations.

The second volume, now before the reviewer, embraces Parts XV., XVI., XVII. These are devoted to the application of the theories and principles of practice to which the first volume has given much space and intelligent thought. The opening of each of the parts and sections here given, as well as the initial paragraphs of many of the chapters, gives the reader an outline of the text which is to follow.

While the work, as a whole, would be by some persons thought unnecessarily large for the subject, yet the practitioner or the student who desires to find a duplicate of his case in hand, and in which he is somewhat in doubt as to the proper method of procedure, will, after carefully examining the text and illustrating cuts, be greatly assisted ; moreover, he will become impressed with the aim and desire of the author to aid in the solution of the subject in many ways ; so careful and clear has the author been in explaining the most important steps in operations, that the reader and student will have little or no difficulty in understanding the entire processes.

Many operations are explained in concise detail, and where the record is not so full, pictorial sketches of the principal stages supplement the deficiency in the text so well that the omission is scarcely recognized.

Throughout the treatise conservatism has certainly been the intention, for the teachings are confined within scientific limits. The operator who intelligently follows the instructions given will be able to accomplish the best results with the least amount of

wasted energy, inconvenience, and discomfort to the patient as well as to himself. We have said that the volume may seem large, yet when we consider the space required for detail in order to explain the starting stages of operations, with suggestions in regard to the alterations in the mechanisms that are requisite to meet the varying changes in the positions of the teeth during the progress of the operation, the student will see little that could be omitted and yet serve his needs so well. Where age, health, and sex would seem to be an important factor in the success of an operation, the student will find timely advice.

In diagnosis and prognosis the inexperienced operator is often at a serious disadvantage. He will find most valuable assistance in this book. Between that which ought and that which ought not to be attempted—between that which can and that which cannot be accomplished—there is a range of uncertainty and speculation that to the student is not only embarrassing but almost demoralizing. By reference to the elaborate index of this volume, there can invariably be found almost duplicate cases and conditions that will be wonderfully helpful.

Every one familiar with the author's views and methods of correcting irregular teeth knows that, when it is practicable, he regards the use of power from screws as the most scientific, yet the use of elastic springs, metallic and rubber, is recognized as important adjuncts, and many such mechanisms and their method of use are illustrated.

The value of appreciating the cause of trouble is not neglected; the great importance of starting right, and in not beginning until the right line of procedure is ascertained, is strongly emphasized. To start blindly on a course, and then after futile attempts abandon the enterprise, is not only discouraging to the patient but of great disadvantage to the operator. This most unfortunate dilemma a careful study of this treatise will obviate.

The author has shown great conscientiousness in giving credit for methods suggested by other operators, and in recording the names of inventors and the dates of their inventions when possible. It would be of interest to greatly extend this notice of the work by describing some of the interesting processes, especially in elevating and in lowering teeth where desired, but that would exceed the function of this short review, the writer not hoping to do more than to interest the profession in this valuable work.

C. N. P.

ANATOMY, DESCRIPTIVE AND SURGICAL. By Henry Gray, F.R.S.
Philadelphia and New York: Lea, Brothers & Co.

In the review of this standard work in this journal, December, 1897, the important fact was overlooked that an entire revision of the illustrations had been made wherever they related to dental anatomy. Heretofore, in books of this character, very little if any care has been exercised to make the dentures absolutely correct. An examination of the illustrations from Figs. 154 to 568, twenty in all, it will be noticed that the teeth have been drawn by one entirely familiar with dental forms, which adds materially to its value from a dental point of view, as well as increasing the value of the book for dental teaching.

THE MONTHLY CYCLOPÆDIA OF PRACTICAL MEDICINE AND UNIVERSAL MEDICAL JOURNAL. Edited by Charles E. de M. Sajous, M.D., Philadelphia. Philadelphia: F. A. Davis Co., Publishers.

"The companion publication of the new annual—the Monthly Cyclopædia of Practical Medicine, the continuation of the Universal Medical Journal—is designed to play a much more important rôle than the latter did as an aid to subscribers to the work. It will consist of forty pages of matter intended to portray, in an easily assimilated form, the practical suggestions embodied, first, in the literature of the previous year, and, secondly, in the current literature, the whole making at the end of each year an additional volume of nearly five hundred pages."

This is from the Introduction by the editor of Volume I., new series, and of Volume XII., old series.

The initial number is a very great improvement over the former issue, valuable as that always was considered, and it must commend itself in every respect to medical readers, and in this category should be classed dentists. The number is yearly growing who have neither the time nor the means to read or subscribe for the medical literature of the world. Here we have it condensed and served in an interesting form at very moderate cost.

The first number contains an interesting and valuable article by the editor, on the treatment of cancer by interstitial injections of alcohol. His reasons for the use of this agent, injected hypodermically, with the cases cited to support them, seem to demonstrate that this agent deserves an extended trial.

This Cyclopædia can be most cordially recommended to all who wish to keep in touch with the progress of the healing art.

PROCEEDINGS OF THE NATIONAL SCHOOL OF DENTAL TECHNICIANS.
For the Years 1893-96. Published 1897.

This pamphlet of one hundred and one pages is filled with the proceedings of this association at Chicago, Old Point Comfort, Asbury Park, and Saratoga. The subject-matter is chiefly composed of papers and reports. These, on the whole, are interesting reading and give many suggestions worthy of the serious consideration of dental teachers.

THE AMERICAN DENTAL WEEKLY. Issued every Thursday. B. H. Catching, D.D.S., Chief Editor. Atlanta, Ga.

Notice of this new dental journal has been deferred for the reason that while the writer has great faith in Dr. Catching's energy and ability, he has been very sceptical in regard to the continuance of a weekly publication and, therefore, preferred to wait for time to remove this doubt, and at the same time enable the reader to form a definite opinion of its value.

Dental weeklies have lived in the professional mind more as a hope than a reality, and until this one was established there was slight reason to expect that any overworked dentist would attempt such a hazardous financial experiment. That Dr. Catching and his co-laborers have been equal to this creates a sense of confidence that it will be continued upon lines laid down. Its short excerpts spiced with some valuable original matter will doubtless meet the demands of many, but it is doubtful whether a weekly of this size can ever become the medium for the original work of the dental profession. This time can alone prove.

The courage of the projectors and their ability for hard work has been demonstrated, and we wish them unlimited success.

TRANSACTIONS OF THE ILLINOIS STATE DENTAL SOCIETY, at the Thirty-third Annual Meeting, held at Peoria, May 11 to 14, 1897. Chicago: The Dental Review, 1897.

This makes a volume of two hundred and sixty-six pages, a large part of which is unusually interesting matter. Several of the articles have a permanent value, and among these may be noted the paper on "The Diffusibility of Coagulants in Dentine." Nothing better has been given the profession on this subject, and, in the view of the writer, practically disposes of this much disputed subject.

Obituary.

DR. HENRY S. CHASE.

DIED at St. Louis, Mo., January 11, 1898, Henry S. Chase, M.D., D.D.S.

Dr. Chase was born at Saxon's Village, Vt., March 6, 1820. He graduated from the Medical College at Woodstock, Vt., in 1843. He subsequently attended the Baltimore Dental College, but did not graduate, the honorary degree of D.D.S. being, in after-years, conferred by Cincinnati Dental College.

He began the practice of dentistry in Woodstock, and resided there until 1856, when he moved to Iowa. He established himself in Iowa City, but in 1867 he accepted the offer of a chair in the Missouri Dental College at St. Louis.

Dr. Chase was a writer of marked ability and had made his name well known prior to his adoption of the somewhat celebrated "New Departure" creed. This radical separation from recognized methods of work made his name, together with his colleagues, a household word in dentistry.

The history of that movement, however mistaken it may appear in the light of the present, was a most interesting chapter in dental history in this country, with which the name of Chase must be associated with his still more pronounced associate, Dr. Flagg, of Philadelphia. That these views have had their influence cannot be denied, and that they have largely contributed to modify practice must be conceded, but whether this has been for the good or ill of the dental profession remains yet to be discovered.

Dr. Chase leaves a widow, four sons, and a daughter.

DR. ALONZO BOICE.

DIED at Kingston, N. Y., after a lingering illness, Dr. Alonzo Boice, of Philadelphia.

Dr. Boice was born March 12, 1847, in the town of Canajoharie, Montgomery County, N. Y.

He commenced the study of dentistry at the early age of fifteen,

with Dr. Frisselle, of Kingston, N. Y., and subsequently graduated at the Philadelphia Dental College in 1869, and was for a time demonstrator of mechanical dentistry in that institution.

He was a member of the American Dental Association, Pennsylvania State Dental Society, the Odontographic Society, the Odontological Society, the Historical Society of Pennsylvania, Philadelphia County Dental Society, etc.

The activity of Dr. Boice in dental work gave him more than a local reputation, and his personal acquaintance throughout the country was large.

His work was peculiar, in that he seemed to delight most in controversy, and hence appeared to take special gratification in advancing dentistry, not by the slower process of scientific research, but by force of law. He was, therefore, a prominent worker wherever laws were to be enforced. While this was his peculiar and most prominent characteristic, he was not slow to appreciate the value of the more scientific side of his profession, which was made evident by his close attention to convention work.

The writer of this frequently came into collision with Dr. Boice from an honest difference in views, but at no time was there ever a loss of respect, for whatever may have been thought of the methods used by him, he was always regarded as a man true to his convictions, and in proportion as an individual follows these is he worthy of honor. The energetic honest fighter against abuses, as he understands them, is a loss to any community, and it is felt that the void made by the death of Dr. Boice will not easily be filled in Philadelphia.

Notes and Comments.¹

CALOMEL AS A CURATIVE AGENT IN DIPHTHERIA.²—Dr. Leonardo D. Judd, of Philadelphia, in the November, 1897, number of the *Annals of Hygiene and of Medicine*, recommends heroic doses of calomel in treating this disease. To an infant of eighteen months,

¹ The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 1338 Walnut Street, Philadelphia.

² A paper read before the meeting of the American Climatological Association.

with malignant diphtheria which had steadily progressed towards a fatal issue in the face of the usual treatment as generally taught and employed, until she was in a nearly moribund condition, he gave ten grains of calomel in water at the first dose, and followed this with five grains every hour until a full, free, characteristic dejection occurred. It took eighty grains to reach such an effect; the child commenced to improve from the fourth dose, and made a splendid recovery; not the slightest ill effect followed. In another case, an adult, he began with a scruple at the first dose, and ten grains every hour thereafter for thirty-five hours, when a copious dejection occurred; smaller ones had preceded, but not until three hundred and sixty-five grains had been given did he get the characteristic action. He uses it also in some cases, in solution, to syringe the nostrils, etc. He regards it as having diagnostic value, having found that where this disease exists the usual action of calomel is resisted until the disease itself is overcome, and says, "Believing, as I do, that all sore throats, where the tonsils are involved and where false membrane exists, are in some degree related to diphtheria, I never hesitate to exhibit calomel in small doses at first, and by its action prove or disprove the diphtheritic tendency of the case. If the tenth of a grain given every hour, dry, upon the tongue, fails to act upon the bowels in any reasonable time,—say, in from eight to twelve hours,—I assume that there is more than an ordinary condition existing, and strengthen the dose or shorten the time between the doses accordingly." He further says, "In true diphtheria calomel is slow to act upon the bowels, and herein lies its diagnostic value, if in doubt. The more severe the type the greater the quantity to be given. I have spoken of the *characteristic dejection* to be secured, especially in the malignant type, before we should let up in the administration of the drug. It should be a green, copious, frothy discharge, resembling 'frog spittle,' such as may be seen in an old water-trough. There is no danger of pytalism. So long as it has the bacilli to antagonize, that alone seems to demand all its energy; and when it has conquered, it leaves in the characteristic evacuation described, and the patient is *absolutely free from any mal-effect*. I have never yet seen a case of diphtheria salivated by calomel in large or small doses, nor have I seen it create hypercatharsis in any case of diphtheria."

GEOGRAPHY OF THE TEETH.—Referring to the interesting series of articles published in the *Popular Science Monthly* on the racial

geography of Europe, the *Dominion Dental Journal* says, editorially, "During a prolonged pedestrian tour in Brittany and Normandy, we were much struck with the difference in the physical types in favor of the latter. Normandy contains the blondest people of France, Brittany the darkest and most benighted. Even the cattle have marked differences which, with the contrasts in the human types, are attributed to the influences of physical environment. Progress and prosperity show their effects in superior physique. Normandy and good teeth; Brittany and bad teeth. Brittany is the most devout (superstitious). The native Breton peasants are the filthiest people in Europe."

GELATINE SUBSTITUTE FOR GLASS.—The *Scientific American*, in commenting upon the new substitute for glass, called tectorium, says it has been found satisfactory in Germany for the following reasons: (1) It can be bent without being broken; (2) is both tough and flexible; (3) is not softened by the rays of the sun; (4) is non-soluble; (5) is not affected by severe cold; (6) is a bad conductor of heat; (7) is well adapted for roofs, on account of its extreme lightness; (8) when exposed to the sun it loses its original yellowish color in time and becomes harder and more durable; (9) can be made, by a very cheap process, to imitate stained glass in such manner that it cannot be distinguished from the genuine article; (10) can be cut by shears, nailed to wood, and transported without danger; (11) can be easily repaired in case it is cut; (12) does not break; and (13) is well adapted for factory windows and skylights for hot-houses, market halls, verandas, transportable buildings, and for roofing. It is further stated that it has as yet only been sold in small quantities and in a few places, the product still being an experiment.

NEW MEANS FOR ARRESTING HEMORRHAGE.—The matter of arresting hemorrhage, even from slight wounds, sometimes is a serious problem. A novel treatment was recently adopted by Dr. Bienwald, and reported in the *American Journal of Surgery*. In the treatment of a small child, the subject of hæmophilia, having failed to arrest the hemorrhage from a small wound on the face by the application of perchloride of iron, he obtained some blood by aspiration from a healthy subject and deposited it on the wound. In a few minutes it coagulated, and the hemorrhage at once ceased. His explanation of the action of the remedy is that it supplies the

ferment necessary for thrombosis in the small vessels. Whether this is correct or not it is impossible to say in the absence of definite knowledge of the pathology of hæmophilia. As affording his explanation some support may be mentioned the success obtained by Wright in his experiments with a solution of fibrin ferment and chloride of calcium as a styptic. Bienwald's ingenious method certainly deserves careful investigation.

TREATMENT OF ROOT-PERFORATION.—Dr. Register advises, in the treatment of root-perforation, to pack in the canal and against the pericementum, at the point of perforation, a small quantity of salol, and over this place a cone of zinc phosphate. He adds, "Of course, the salol disappears, as it always does after a period when used as a canal filling, but while it lasts it performs its office as an unirritating antiseptic." From our clinical experience, we would say, the fact that the salol disappears is reason sufficient to discard it, either for the purpose spoken of or for a root-canal filling. For closing these perforations there is nothing better, after thorough sterilization, than a small quantity of thick chloro-percha.

THE DENTIST AND MORALS.—A recent medical writer says, "A physician who cannot assimilate morals into his being can never expect to amount to much as a man. In other words, a physician as a man is measured by the depth of his moral nature, and not by the pretensions to professional greatness with which he would veneer his real self." This is quite as true of the dentist. It is for this reason that many men seemingly great are really small. They are out of harmony with true success, because they are out of harmony with their better selves.

IMITATION GRANULAR GUM.—Dr. E. A. Randall, in the *Dominion Dental Journal*, gives the following method for imitating the granular appearance of the natural gum: "When using plain teeth and pink rubber, instead of finishing gum with file and sand-paper, use with the dental engine a large round bur (rather dull); a smaller bur in the corners between the teeth. With the rapidly revolving bur carve the gum festoons, moving first vertically and then longitudinally; as the carving process nears completion pass the bur lightly over the surface, then polish with brush-wheels, pumice,

and whiting. This gives that granular appearance peculiar to the natural gum, and not a perfectly smooth surface."

HOT WATER TO RELIEVE PAIN.—In a paper read before the New Jersey State Dental Society, Dr. E. H. Allen advised the following treatment:

"To reduce pain and inflammation of the root of the tooth in cases of pericementitis, also the pain occasioned by a setting of a crown or bridge, apply hot water to the gums and about the root of tooth or teeth affected. For the application of the hot water, use a two-quart fountain syringe, hung about six feet from the floor, conduct the water through rubber tubing to the mouth of the patient, delivered through a nozzle with an opening about one-twenty-fourth of an inch; water to be as hot as can be borne in the mouth. The water can be taken out by the saliva-ejector attached to the fountain spittoon. This will in most cases give quick relief."

Our method of treating, under similar conditions, is to have the patient hold hot water in the mouth, which is repeated several times. This assists the capillaries in establishing a more normal circulation, thus relieving the pain.

Current News.

DENTAL SOCIETY OF THE STATE OF NEW YORK.

At the Thirtieth Annual Meeting of the Dental Society of the State of New York, to be held at Albany, May 11 and 12, 1898, papers will be presented by the following members of the profession:

M. W. Foster, M.D., D.D.S., Baltimore, Md.; M. H. Cryer, M.D., D.D.S., Philadelphia, Pa.; J. S. Marshall, M.D., D.D.S., Chicago, Ill.; I. N. Broomell, D.D.S., Philadelphia, Pa.; S. S. Stowell, D.D.S., Pittsfield, Mass.; E. A. Schillinger, D.D.S., Dalton, Mass.; R. Ottolengui, M.D.S., Correspondent; L. C. LeRoy, D.D.S., Committee on Practice.

All members of the profession are cordially invited to attend and participate in the exercises commemorative of the occasion.

H. J. BURKHART,

President.

C. S. BUTLER, Buffalo, N. Y.,

Secretary.

PENNSYLVANIA STATE BOARD OF DENTAL EXAMINERS.

THE Board of Dental Examiners for the State of Pennsylvania will hold two examinations this spring of candidates for license to practise dentistry in this State. The first commencing April 12, simultaneously in Philadelphia and Pittsburg. The second commencing June 14 in Philadelphia. Each examination will take four days. In making application to the Dental Council at Harrisburg for a license, those desiring to come before this board in April will please state in which city they prefer to be examined.

J. C. GREEN,
Secretary.

KANSAS STATE DENTAL ASSOCIATION.

THE Twenty-seventh Annual Meeting of the Kansas State Dental Association will be held at Topeka, May 10, 11, and 12, 1898. An interesting programme is being prepared. Members of the profession are invited to attend and participate in proceedings.

EDWARD BUMGARDNER,
Secretary.

ILLINOIS STATE DENTAL SOCIETY.

THE Thirty-fourth Annual Meeting of the Illinois State Dental Society will be held at Springfield, May 10 to 13, 1898. Dentists practising in the State of Illinois who are not members of the Society, and dentists of other States, are cordially invited to attend. Hotels and railroads will make the usual reduction. A large attendance is anticipated.

A. H. PECK,
Secretary.

92 STATE STREET, CHICAGO.

IOWA STATE DENTAL SOCIETY.

THE annual meeting of the Iowa State Dental Society will be held in Des Moines, May 3, 4, 5, and 6, 1898.

WILLIAM GILMORE CLARK,
Secretary.

THE International Dental Journal.

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Original Communications.¹

METHOD OF USING SOFT FOIL.²

BY BENJAMIN LORD, D.D.S., NEW YORK.

I AM asked to explain and demonstrate my method of using soft foil, which I ought to be quite willing to do, if for no other reason than that the Executive Committee has requested it.

It may be said that such demonstrations are a new departure in the proceedings of our meetings, except in a recent instance, but the subject is a thoroughly practical one, and I hope that many of our members and guests will be asked in due time to explain their methods. That will enable us to learn a great deal from one another of different styles and modes of operating, and by careful comparison and an earnest desire for that which is most effective in securing the best results, much progress may be secured.

Notwithstanding the many meetings dentists hold, and the social and friendly intercourse which they highly enjoy, they really know very little about one another's methods of filling teeth, or the instruments they use for the purpose. It is strange that there is no

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before The New York Institute of Stomatology, Tuesday evening, March 1, 1898.

standard among us, but every dentist has his own peculiar way of working, and it has been said that very few change much from seeing or from being told of other and perhaps better ways and methods, but I do not believe that the saying is true.

There must be a best way of doing almost everything, notwithstanding that so much precision and accuracy are required in the work of filling teeth, yet we find that good and successful operations are made by different operators, who use quite different methods and instruments.

This, of course, does not prove that all the methods practised are equally good, but it does prove that the individual methods may for the time being at least be the best for those using them.

I propose to have a sort of familiar talk with those present, and it will be understood that it is not my purpose to show how to fill teeth, but to tell how I do it: I will speak of the preparation of cavities, of the instruments I use for the purpose, and how I use them; but will not, for the want of the necessary facilities, attempt to prepare cavities. This is beyond what I was requested to do, but I have felt that it might not be without interest, as the success of a filling depends so much upon the proper preparation of the cavity.

For instruments I depend largely upon what is known as the hatchet excavator. The blades, of course, must be of different lengths and widths and curved at different angles, some having also a slight bend in the shank. Some are wider at the cutting edge than at the angle of the curve, others have the sides or edges parallel, and some of both these classes should have one or both corners ground off so that the cutting edge would be rounded. Then I use a cutting instrument of a peculiar shape, which is most effective on the labial and buccal surfaces, and on the approximate surfaces where the spaces are considerable.

This instrument is specially adapted for preparing and shaping the walls or sides of the cavity, and is not intended to be used on the floor of the cavity.

I use burs very little except to open crown cavities and dress margins, the proper preparation of which I consider of the greatest importance to the accuracy and success of the fillings.

I have, as can be seen, instruments cut much as burs are, for dressing away the edges of the cavity, after the removal of the decay, and for giving the cavity a proper shape, including a slight undercut.

These instruments, if properly used, take away all decomposed

structure and very thin edges, leaving margins of a thickness not likely to be crushed or powdered in any part of the operation of filling. Then I use a suitable instrument to give the edge of the cervical wall a slight bevel outward, so as to bring the filling slightly over the margin of the cavity. I would also thus bevel other margins that are thin.

I feel that the dental engine is used very often to the destruction of healthy tooth-structure and the marring and notching of the margins of cavities. It is unquestionably a very useful appliance, and it is also a very harmful one when used improperly or where it ought not to be.

I prefer soft foil because of its easy adaptation to the walls of the cavity and the greater ease and certainty with which it can be placed and packed without danger of tipping from becoming hard too soon, which is often true of cohesive gold.

Cohesive foils and other preparations of cohesive gold have their uses, such as the restoration of broken corners or the sides of the teeth, where it is desirable to make such restorations, but I may say I think it is done quite too frequently, particularly with the front teeth, thereby giving them a more unsightly appearance than the marred or broken corners would present.

My experience and observation lead me to believe that cohesive gold is not so well adapted for general use as soft gold.

In my judgment the best form in which to use gold is in sheets, parts of the sheet being folded in strips of suitable widths for the cavity in which they are to be used. I consider that strips or folds can be handled with more ease and certainty in the process of filling than can rolls, pellets, or blocks.

It is my belief that too many forms of gold are prepared for our use, often leading to confusion and embarrassment, particularly on the part of the inexperienced. If my memory serves me correctly, the late Mr. R. S. Williams advertised that he prepared and had for sale one hundred and fifty different varieties of gold for dentists' use.

Filling teeth has so many difficulties to be overcome, and so much accuracy and fidelity are required, that we must follow certain lines for a long while, and, in the use of particular forms of gold, to arrive at a good degree of excellence.

By using suitable points all cavities having three walls can be filled and the fillings contoured by the use of soft foil; this may be done with equal certainty and success with tin-foil or with a combination of gold and tin.

I depend mostly upon a single form of instrument for placing the gold and for condensing it towards the walls of the cavity. Occasionally I use a point somewhat more curved to carry the gold already placed, with more force against the wall or into a corner of the cavity (always guarding against too much pressure), so that each additional layer may not only be placed against that which is already in position, but will be carried into it, thereby uniting the whole mass.

Then I come to the surface condensing, which I begin with a small four-sided instrument, curved to an angle of forty-five degrees and pointed, the sides grooved, and the edges of the grooves serrated.

I assume, as must be the case to insure the best results, that the foil has been accurately placed, the layers added in regular order, and condensed as solidly as possible by lateral condensing, and that the gold is raised sufficiently above the margins of the cavity, so that after the surface is made solid by using the point of the instrument and the edges of the groove, the filling will still have a contour or oval surface, if an approximate filling. I wish to attach great value to this surface condensation with small points, as it more or less spreads the filling to some extent towards the walls of the cavity, and ties the whole mass together more securely. I speak of leaving the surface of the filling contoured or oval, which is certainly most natural, and, if so, highly desirable, but there is interest in the old style of the flat surface, or even in the concave surface, as there is much more certainty that the gold will be made solid against the walls of the cavity, with less care, when the surface is thus worked down. We find that fillings so finished have done most excellent service.

But by using points and making the pressure near the margin of the filling, so as to condense against the walls, and also using the edge of the groove of the instrument I have alluded to, full success may be secured, when the surface is left contoured.

I now come to the use of the broad instrument with one side flat and the other somewhat oval, both for further condensing and burnishing. The oval side will not be so likely to come in contact with the margins, and can be used to greater advantage to condense the surface; the flat side also possesses advantages over the oval for a part of the work.

I am now ready to give the margins their finish, and I think it will be seen that my instruments are well adapted for the purpose. They have one side flat and the other oval, are cut like burs, and

are used much as a file of the same shape would be. For the final finishing I use a small instrument, the same as I use for the removal of tartar or any roughness about the teeth, and if there should still be any surplus gold at the margins, this instrument will be sure to detect and remove it.

I attach little if any value to the mere burnishing of the surface of fillings, only so far as it gives greater solidity to the surface. The great point in the finishing of fillings is the smoothness and solidity of the margins, so that no surplus material be left overhanging.

I do not think that any kind of a disk, sand-paper, or corundum should be used on the approximate surfaces for finishing fillings, as they are liable to cut away tooth-material or filling that ought not to be removed, and I do not like the use of the polishing strips, for the same reason. I also think that a bur or burnisher in the engine should never be used to reduce or polish fillings in the grinding surfaces of the teeth, as there is too much danger of reducing the cusps or injuring the margins of the cavity.

The grinding surfaces should be finished to correspond in irregularity to the natural surface of the tooth, and instruments may be used for that purpose. The burnishing is really of no importance except to give solidity.

It will be observed that I have gone into quite a good deal of detail, perhaps more than was required or in good taste, except, perhaps, to students, but it seemed to be necessary in order to cover the ground. Of course, a great deal has been left unsaid, and it is earnestly hoped that the question may be considered only just opened, and the subject in all its aspects and bearings may be thoroughly discussed, so that we may if possible determine some of the causes of so much failure and correct them.

I will now show my instrument and my manner of preparing and handling the gold.

I use Abbey's foil, and prefer No. 5. I cut a sheet generally into four pieces; if the cavity is small, I would cut the sheet into six pieces. I fold each piece into strips, for the larger cavities about an eighth of an inch wide, and for the smaller ones a sixteenth of an inch.

For the folding I use one side of my shears, instead of a table-knife or a paper-cutter, and I fold on a small cushion made of soft leather and filled with wool. I prefer this to anything harder. The strips are placed on a folded napkin, and I use the point of the instrument with which I am working to pick up the strip and carry

it to the cavity. I usually cut the strips into two pieces, sometimes three. The instrument that I use and depend upon mostly for placing, uniting, and condensing the folds is properly curved at the end, and an absolute point made by a very short bevel on three sides with a sharp file, and the fourth side touched at the point very slightly with the file, so that the line of the curve may not be changed.

I do not, as would be understood, condense with the point of the instrument, but with the side and edge of the bevel, and unite the folds with the point.

I strive as far as possible, in placing the foil in the cavity, to fold the strip in so as to form a loop and bring the loop to the surface.

I prepare and use tin-foil the same as I do gold, and also gold and tin in combination. I use three parts gold and one of tin when combining the two metals, folding them together with the gold outside.

I hold in my hand a tooth having a cavity with four walls, which, of course, is the easiest kind to fill. I begin by putting the first piece against the most distant part of the cavity, and the second piece against and into the first piece with a hard, firm pressure, and so on against the walls, and filling in the centre as is required, to the end.

To fill a compound cavity or one with three walls only, I would pursue the same method, by placing, uniting, and packing against the walls and filling in the centre, and finish by building up where the wall of the cavity was wanting.

THE PREPARATION OF THE MOUTH FOR AN ARTIFICIAL DENTURE PREPARATORY TO TAKING AN IMPRESSION.¹

BY ROBERT H. NONES, D.D.S., PHILADELPHIA.

IN offering, this evening, this paper, it is not with the idea of presenting any originality whatever, but rather of calling attention to a part of that branch of dentistry which is seemingly much neglected,—namely, prosthesis.

¹ Read at a meeting of the Academy of Stomatology, January 25, 1898.

And why neglected? Surely not because it is so thoroughly understood, nor because it is of little importance; certainly not the latter, for the last resort of anything must naturally be of vast importance. Prosthesis is the last resort in dentistry, a reliance when our patients have arrived at the stage when we have exhausted all means for preservation of the natural organs.

In presenting the paper it is with the idea that a discussion and a line of thought may be brought out which will be of interest to perhaps not only a few, but many of us.

Naturally the first step in the preparation of the mouth for an artificial denture preparatory to taking an impression would be an examination of the mouth, upon the thoroughness of which depends largely the success or failure. We must observe carefully the condition of the parts, whether normal or abnormal; discover, if possible, the cause or causes of the abnormal conditions, and remove or treat them. We must give particular attention to the extraction or retention of teeth or roots, and at the same time plan the future denture, mapping out what to make and how to make it.

In the examination of an edentulous mouth notice the general shape, whether it be regular or irregular, the vault high or low, the ridge prominent or flat. Note carefully any hard or bony protuberances in the vault of the palate, as well as an irregularly resorbed ridge of either the upper or lower jaw.

If soft or flabby conditions of the tissues exist, they must be equally well noticed that proper relief or pressure may be given with the denture, or that they may receive treatment either surgically or medicinally. Location of the muscles must be carefully observed, as it is of vital importance to the proper outlining of the plate, attention to which gives comfort to the patient. All these conditions have considerable bearing on the planning of the denture and must be carefully observed.

Another equally important condition is that of a fissure of the vault, starting in the soft palate and extending at times quite far into the hard palate. This is often so narrow in appearance as to deceive one as to its depth, except upon close examination. These fissures run usually through the centre of the mouth, but may be found double, one on either side of the hard central prominence.

Frequently unsuccessful dentures would have been successful ones had proper cognizance been taken of this condition. The knowledge of its existence will enable us to avoid a space between the denture and the mouth, and to exclude the air which would otherwise enter.

Inflamed or irritated mouths, referring for the present to edentulous mouths, may result from various causes, both local and systemic.

Dyspepsia plays an important part, and its treatment would naturally be relieved by systemic treatment at the hands of the general practitioner.

The immoderate use of ardent spirituous liquors and of tobacco may also cause conditions of irritability. Upon the partial or total cessation of the abuses we should naturally expect relief.

The most frequent cause of these inflamed or irritated conditions, and one which should be looked for, is a previously worn denture. How frequently will a patient, when we are about to make an examination, quickly remove from the mouth a denture, and with an expression of shame carefully close it from view in a napkin or in a handkerchief. The cause of the embarrassment, as a rule, is the condition of the denture, which in many instances is covered with particles of food from the previous meal or meals, and for which generally profuse apologies are offered.

Another cause, less frequent, but not at all infrequent, is the adaptation of foreign substances, such as wax, cotton, and even chewing-gum to ill-fitting dentures. In this connection I recall an incident showing apparently how an otherwise cleanly person may be unconscious of the actual condition of the mouth.

A gentleman, about sixty years of age, his general appearance denoting refinement, neatness, and cleanliness, sought my services to have a partial lower metal clasp piece repaired. One of the natural teeth had become quite loose, and he wished an artificial one attached to the plate in its stead. On examination I noticed it was rather a difficult piece to remove, and told him to remove it, as I wished to save him the inconvenience which is often occasioned by the removal by the dentist of such a piece. I shall never forget his look of mingled surprise and helplessness when he told me it had never been removed from the time it was first inserted, some five years previously.

I removed the piece with some difficulty, making no effort to hurry it past his nostrils during the withdrawal from the mouth, which caused him, as I had anticipated, to withdraw his head. In condition it was, almost needless to remark, foul and covered with calculus and *débris*. The discomfiture of the patient was marked and not at all feigned. He informed me that he always believed himself to be cleanly, bathing at least once daily and changing his under-garments as precisely. His mortification was intense.

While we should naturally expect human beings to be cleaner in the mouth than any other part, it is our duty always to instruct them in regard to the proper care and removal of dentures. We cannot expect to find a mouth in other than an abnormal condition under such circumstances.

Frequently we find the mouth irritated from roughness on the plate. In some cases there are prominences upon so-called temporary plates which were formerly seated in tooth-sockets; in other cases, sharp, rough, angularly outlined, and deep vacuum-chambers, or perhaps too highly outlined margins which impinge upon the muscles and mucous membrane, cutting them and creating irritable wounds; this occurs markedly in lower dentures. How can we possibly expect success to follow the making of a denture on such faulty foundations, and yet how frequently are impressions taken under such conditions, success being expected to follow, and when it does not, this branch of dentistry is condemned and detested. It is attention to such matters that raise prosthetic dentistry from a mechanical to a scientific basis, and tends to bring pleasure in the work as well as satisfactory results.

The treatment in such cases as the foregoing is simple. First comes the removal of the cause or causes. If the denture be a metal one, carefully boil it in a dilute solution of sulphuric acid; upon removal, allow it to cool, when it should be washed with soap and water, and placed in a solution of sodium bicarbonate, thus neutralizing any acid beneath the porcelain teeth, after which any roughness should be removed and sharp or rough edges of vacuum-chamber dressed down and smoothed. The plate should then be brushed with a stiff lathe-brush and pumice, then polished and carefully washed.

The treatment of a vulcanite denture is the same, with the exception that it is allowed to stand in a cool solution of hydrogen dioxide in place of warm sulphuric acid.

Small pin-point prominences may be looked for, caused by the vulcanite forcing into the pores or small bubble-like places on the surface of the plaster, these are frequently a source of great irritation and annoyance to a patient, and they can be largely avoided by using a tin model instead of a plaster one. When they exist in a plate they should be removed.

The denture after proper treatment, providing it fits well enough and is not likely to cause further irritation, may be worn until the mouth is in condition for the impression, otherwise its use must be discontinued.

The medicinal treatment of the effects produced by the roughness consists in the application of antiseptic mouth-washes, such as "listerine," "borine," etc. The most effectual and quickest treatment I have found is the painting of the inflamed parts with tincture of iodine, together with the frequent use of a three-per-cent. solution of hydrogen dioxide by the patient as a mouth-wash.

During the examination of the mouth not infrequently will be found prominent points of the alveolar process, due to uneven resorption after the extraction of the teeth. These points should be removed by surgical means.

The attachment of the frænum of the lip to the alveolar process frequently being very low, it may interfere with the upper margin of the denture, or we may find what is known as a double lip or a false lip, which is caused by an ill-fitting plate or one extending too high. In some cases this extends below the natural lip. These with the excessively flabby conditions may receive surgical treatment.

What is of less frequent occurrence is the prominence of the alveolar process, which may be so excessive as to eliminate the idea of an artificial denture. I recall such a marked case, which I was fortunate enough to see both before and after operation for the condition. This was performed by Dr. M. H. Cryer, who kindly gave me the opportunity to see the case. Any one upon looking at the patient with her lips closed, which was a difficult act for her to perform, would have concluded that her dentist had made a grave mistake in the fulness of her denture. Dr. Cryer performed an operation, removing about a quarter of an inch of the labial and buccal process, thus placing the mouth in a fit condition for an artificial denture. The surgical aspect of this subject I note not alone on account of its great importance, but to show how an effect may be created, if we are aware of the proper course to pursue.

Should the mouth not be an edentulous one, we may look for other causes of irritation besides those already noted.

One, and an important one, is salivary calculus, an irritant which should generally be removed. With exceptions to this rule I shall deal later. The methods of removal are so well known that it is unnecessary to repeat them here. I have been very successful with that pursued and I believe suggested by Dr. Henry Register, the use of iodine in connection with the ordinary scaling method, which I follow up with and have the patient use freely the hydrogen dioxide. In fact, hydrogen dioxide will keep a mouth in better condition than anything else I have tried, and I give my patients to understand that they cannot use too much of it.

In mouths containing some natural teeth we will frequently find partial dentures creating irritation of the gums about the necks of the teeth. A sinking in of the plate and a bulging out of the gum around and between the teeth and plate is caused most frequently by the plate not fitting accurately to the natural teeth. We may also look for the same effect from roughness and uncleanness, as in the case of full dentures, and they should be treated in like manner.

The extraction or retention of teeth or roots depends upon the advantages to be gained thereby. When they cannot be brought to a healthy state they are to be extracted. To make a broad assertion, they are not to be extracted unless positively detrimental to the health of the patient and to the success of the denture. We must remember that an artificial tooth is, as a rule, never as valuable as the natural organ. No tooth is to be extracted merely to facilitate the taking of an impression or the making of a denture; such action would be malpractice. We should adapt ourselves to proper circumstances rather than adapt the circumstances to ourselves.

Taking in regular order the teeth of the superior jaw and commencing at the centrals, if one or both are alone remaining, it is preferable to extract, on general principles; but there are exceptions, with which I wish to deal later.

I should extract first, on account of the difficulty of matching the natural teeth with porcelain; secondly, if left in, there will in all probability be interference with the bite, which, as a rule, is very short, thus making a very weak denture, from which the teeth are constantly being broken off; thirdly, breaks are liable to occur through the centre of the plate, which is much weakened by loss of continuity, although this, of a lesser evil, can be obviated by strengthening the plate; and fourthly, the forcing of the dentine against the centrals would be a constant source of irritation to them, causing resorption of the process supporting them, while the gum about the necks of the teeth would be continually irritated.

The laterals, if standing alone, should be extracted for the same reasons.

If all the four superior incisors are in place, they should be retained, other conditions permitting, as the cuspids can be artistically matched to them.

The cuspids should be kept whenever it is possible; even the roots should be preserved and crowned, as they not only retain that facial expression which it is almost impossible to regain with an artificial denture, but also guide and stay the bite.

They should be extracted, however, when they cannot be brought to a healthy condition, or when so abnormally situated as to interfere with proper adjustment of a denture, as, for instance, when interfering with the bite or protruding to such a degree as to cause disfigurement, or if drooping inward, especially if occluding inside of the lower teeth; or if there be excessive recession of the gum, or a tilting from or towards the median line, thus making it impossible to properly adjust artificial teeth between the natural teeth; or if out of line from or towards the centre, not allowing sufficient space for the proper size or number of teeth; or if elongated, giving a marked canine expression to the face.

All the foregoing conditions of the cuspids are detrimental to the proposed denture, and unless they can be corrected by the removal of the natural crowns and the adjustment of artificial ones, thus preserving the desired expression with the roots, the teeth should be extracted.

Single cuspids should be extracted, except when male patients of middle age seem loath to lose them because of good service. Smokers especially are apt to find such teeth serviceable in holding the cigar or pipe.

Bicuspid, except when on both sides of the mouth and useful as clasp attachments, should be extracted.

Molars should be retained whenever possible, as they afford a means of support by clasping in mouths which are difficult to fit with vacuum plates. The roots should be preserved and crowned for clasp attachment.

In the lower jaw none of the teeth should be extracted when it is possible to retain them, with possibly the exception of a single central or lateral or laterals in pairs.

The other teeth afford a means of support for a denture until such time as the patient may become accustomed to its management.

In extraction all sharp prominences of the alveolar process should be removed, thus permitting a smooth, even resorption.

With aged or invalid patients it seems occasionally to be better to allow quite large deposits of salivary calculus to remain upon the teeth, for the reason that were it at once removed and a plate made it is likely that the teeth would be promptly lost and a new denture necessitated. By leaving the calculus the patient becomes accustomed to the use of the denture, and many changes afterwards necessitated are more readily tolerated.

In this connection I recall a case in my own practice which will probably illustrate my meaning.

FIG. 1.



Mutilated ear.

FIG. 2.



Artificial vulcanite piece.

FIG. 3.



Reconstructed ear.

Some three or four years ago I made a partial upper gold clasp piece for a very amiable lady. If I remember correctly, there were several bicuspid and molar roots on each side of the mouth, which I wished to extract. Upon so informing the patient, she asked, "Can you not let them remain? They give me no trouble, and will probably outlast me." I read in her look that she was an invalid, and afterwards one of her friends informed me that she was sick, but did not know her trouble, nor ever mentioned her illness when among her friends. I adjusted the piece over the roots, and it was satisfactory. She died about two months ago, and upon post-mortem examination cancer of the stomach was revealed. Of course, it was a source of satisfaction to know that I adapted myself to the circumstances rather than the circumstances to myself.

The preparation of the mouth for a denture or other forms of prosthesis may be as scientifically carried out as any other part of dentistry. Prosthetic dentistry is what we make it.

This recalls to my mind the answer of the celebrated Joshua Reynolds. When asked as to how he mixed his colors, he replied, "With brains."

AN ARTIFICIAL PIECE FOR AN EAR.

BY WILLIAM DUNN, D.D.S., FLORENCE, ITALY.

AMONG the curious and unusual cases which the dental practitioner is sometimes called upon to undertake the following may present some interesting features. The illustrations from photos speak for themselves. The patient, a young man of twenty-four years, while out shooting, had the misfortune to discharge his gun a little too close to his head while jumping a fence, and blew off a piece of his left ear. The wound healed slowly and left a permanent deformity which was very noticeable when standing full face, and much distressed the patient, who saw his chances as a suitor decidedly on the wane. He was sent to me by an orthopædic doctor, after vain attempts at patching him up.

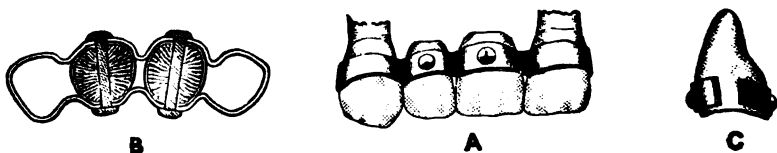
The course I followed was the simple one of building up the missing part in modelling compound as much as was possible, making a vulcanite piece in the usual way, then building up other parts on it again with modelling compound and revulcanizing. It was a work of patience, for there were many inequalities on the piece, and great difficulty was experienced in getting close adaptation at

the edges, the soft tissue of the ear giving way under the slightest pressure. Springs and clips were tried and abandoned, not being tolerated by the very delicate skin back of the ear. The solid and somewhat extensive piece, as shown in the illustration, was found to be the only practicable one. When complete, the vulcanite was painted with oil color in close imitation of the skin. Powdered talc and very fine pumice removed the gloss of the dried paint; and the edges were lined with cotton-wool attached with collodion on the under surface, to give the appearance of soft down and make the edges less visible. The completed work presented a very life-like appearance, has not been at all noticeable, and has given satisfaction for over a year. Photos were taken with apparatus kindly lent by Mr. Longworth Powers, son of the great Hiram Powers.

ETRUSCAN BRIDGE-WORK.

BY HENRY H. BURCHARD, M.D., D.D.S.

FIGS. A, B, C represent a specimen of Etruscan dentistry, the prototype of a modern variety of bridge-work. It consists of a continuous band of gold crimped into the interspaces between the teeth, to secure close adaptation. Two natural teeth are cut out, curved beneath, to fit them to the natural gums, as shown in C.



The teeth are secured to the band by means of two button-head rivets piercing both band and teeth, as shown in B. In A, the piece is represented in position for which it is intended. The color of the gold in the specimen indicates an alloy of gold and silver, 22 to 23 carats fine.

The drawing was made from specimens, Nos. 10,334 and 10,335, of the Mayer collection of antiquities in the Brown Museum, Liverpool, England. They are probably the same referred to by Dr. W. H. Waite.—*Independent Practitioner*, vol. vi., April, 1885, p. 195.

Abstracts and Translations.

INSTRUMENT NOMENCLATURE WITH REFERENCE TO INSTRUMENTATION.¹

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PART I.

INSTRUMENT NOMENCLATURE.

(Furnishing the Basis for School Instruction.)

In the development of any system of nomenclature, the basis should be the names that have arisen in the common speech of the profession. These names have a meaning, and, if we gain an understanding of this meaning, we will be able to classify the names in accordance with it, and in so doing present an orderly nomenclature. In doing this it is often necessary to choose between two or more names that have been applied to the same thing and occasionally to separate two items that have been called by the same name. In this way the uncertain nomenclature in vogue, developed at random in the first instance, is rendered orderly and definite. This is readily done in instrument nomenclature, and without the introduction of any considerable number of new terms.

NAMES OF PARTS OF INSTRUMENTS.

Cutting Instruments or Excavators.—Each excavator is composed of a shaft which is used as a handle, a shank, and a blade. Usually in excavators the shaft is perfectly straight and without variation in size. The *shank* begins with the first turned part and connects the shaft with the *blade* or working point. It usually tapers from its connection with the shaft to where the blade begins.

The *blade* is the part bearing a cutting edge. It may be said to begin at the angle which terminates the shank—the last one, if there be more than one angle—and ends in a cutting edge.

Pluggers have no cutting edges and therefore no blades, as “a blade is the leaf-like portion of an instrument bearing the cutting edge.” The shank of pluggers, therefore, extends to the working

¹ Abstract from a paper read before the National School of Dental Technics.

point, though they may have similar angles to the excavators. (We should have a specific name for that portion of the plugger corresponding with the blade of the excavator.)

CLASSIFICATION OF NAMES OF OPERATING INSTRUMENTS.

Existing names of operating instruments may be divided into order names, suborder names, class names and subclass names.

An *order name* is one designating such instruments as are used for a purpose so similar that groups have received a name indicating the purpose of their use, or answers to the question, "What for?"

The well-defined order names are *excavators*, *pluggers*, *separators*, *scalers*, *finishing instruments*, and *accessories*.

A *suborder name* is one designating the locality, position, or manner of use, in such a way as to distinguish certain instruments from other members of the order, or answers the question, "Where, or how used?"

A *suborder name* is often attached as a prefix to the order name, as *hand-plugger*, *mallet-plugger*, *push-scaler*, *pull-scaler*, etc. *Enamel trimmer* is a suborder of excavators. *Burs* belong both to excavators and finishing instruments as suborders, as *cavity bur*, *finishing bur*. The word *bur* is properly a class name,—they have no order name.

A *class name* is applied to a group of the members of an order and describes the point or immediate working part, as *hatchet* or *hoe*, descriptive of the blades of excavators, or the working point of pluggers, as *convex plugger*, *serrated plugger*, *smooth plugger*, etc.

A *subclass name* describes the angles and curves of the shank leading to the working point or blade, as *bayonet plugger*, *spiral plugger*, *contra-angle hatchet excavator*.

In the common speech of the profession, these names have been habitually compounded. Suborder names are prefixed to order names,—as in *mallet-plugger*, *hand-plugger*, etc. Class names are prefixed to order names, as in *hatchet excavator*, *spoon excavator*, *hoe excavator*, etc. Also, subclass names may be prefixed to either order or class names, or all these joined, as in *contra-angle hatchet excavator*, or in *bayonet plugger*.

In all these compoundings, the order name is last, indicating the use or purpose,—the suborder name prefixed, indicating how or where, while the class name is descriptive of the forms of the working point, and the subclass name the form of the angles and curves of the shank leading to the point. It should be noted particularly that these terms are applied to groups of operating

instruments. They specify the kind of instrument but do not individualize the instruments of the group. These may vary indefinitely in the widths, lengths, and angles of blades. For these differences we will propose other terms.

RIGHTS AND LEFTS.

There is a distinct division in operating instruments, known as *rights and lefts*. Among excavators we have two forms of rights and lefts. The *bevelled rights and lefts* and the *lateral cutting rights and lefts*, or, true double plane instruments. The bevelled rights and lefts are hatchet forms made rights and lefts simply by the form of the bevel of the cutting edge. Most of the hatchet forms have bibevelled edges,—i.e., the edge is formed by grinding equally from the two flat sides of the blade. The bevelled rights and lefts are formed by making two hatchet forms alike, and then grinding the bevel all from one side of the blade on the one, and all from the other side on the other. The result is a pair of instruments, the one suitable for shaving down the buccal wall of a cavity, and the other suitable for shaving down the lingual wall. The cutting edges are upon opposite sides of the blades, making them rights and lefts. These are used mostly for cutting enamel in opening cavities, but may also be used very effectively in cutting dentine. Any of the hatchet excavators may be made in pairs and converted into bevelled rights and lefts, but the general adoption of this, while producing excellent instruments, multiplies the number of instruments in the operating-case to such a degree as to cause confusion. For this reason the formation of bevelled rights and lefts should be very strictly limited to enamel instruments, or to special instruments for heavy cutting.

LATERAL CUTTING RIGHTS AND LEFTS.

True Double Plane Instruments.—The double plane or intersecting plane rights and lefts are a totally different class of instruments, and are designed for lateral cutting, while the other forms, single plane instruments, are for direct cutting. If any of the single plane instruments be laid upon a table or any plane surface, in a certain position, it will readily be seen that all of the angles and curves, no matter how many, are in a single plane. If it is held before the eye, in a certain position, the instrument appears straight; such instruments are suited for direct cutting.

If we carefully examine the rights and lefts known as spoons or rapid excavators, it will be noted that each has an angle or curve

that is not in the same plane with the principal angle or curve, but in a plane that intersects the plane of this principal angle at right angles. These we will call *double plane* instruments; they differ essentially from the single plane instruments in that they are specially suited for lateral cutting. They are always made in pairs. They are first formed similarly to the hatchet excavators, but after the blade is formed the blade of one is curved to the right and the blade of the other is curved to the left. This important division of cutting instruments is confined mostly to what has become known as spoons. They are suited to scooping out masses of carious material. They are not of much value for cutting hard material. This form of rights and lefts is also used occasionally in pluggers.

DEFINITION OF CLASS NAMES.

A *class name* is one that describes the immediate working point of the instrument.

CLASS NAMES OF EXCAVATORS.

Hatchet.—The shank has one or more angles or curves, the last length forming the blade, the edge of which is in a plane of the angle or angles.

Hoe.—The shank has one or more angles, the last length forming the blade, the edge of which is in a plane intersecting at right angles the plane of the angle or angles.

Spoon.—These are always made in pairs. They are first made in the form of hatchets, and then the blade of the one is curved to the right and the blade of the other is curved to the left, then the cutting edge is ground to a semicircle. This curve of the blade is in a plane that intersects the plane of the principal angle or angles at right angles, making the instruments true rights and lefts.

Discoids.—(Disk-like, circular.) The blade is circular in form, having a cutting edge extending around the whole periphery, except that portion by which it is joined to the shank. This circular blade is placed at more or less of an angle with the shaft.

Formerly this form was called a spoon, several forms being grouped under that name. Discoid blades are sometimes seen on double plane instruments of various forms.

Cleoids.—(Claw-like, in the form of a claw.) Sharp-pointed blades in the form of a claw, with cutting edges on two sides of the blade.

Chisels.—Straight blades with cutting edge formed by bevelling from one side. The blade is usually straight with the shaft, but may be slightly curved.

Binangle Chisel.—A chisel blade placed at a slight angle with the shaft in the hoe form. They are contra-angled.

Rotary cutting instruments will not be included in this list.

SUBCLASS NAMES.

A *subclass* name is one applied to and descriptive of the angles and curves of the shank of an instrument which leads to the blade or working point.

Monangle.—An instrument having one angle only leading to the working point as in pluggers, or forming the blades as in excavators. Monangles form a large majority of excavators. In the greater angles only the shorter blades can be successfully used as monangles, for the reason that when the blade is long its inclination carries its working point laterally so far from the central line of the shaft as to render the instrument liable to turn in the hand when the edge is forcibly applied. This renders the instrument unsteady and ineffective. To remedy this effect, all cutting instruments, in which the angle and length of blades will carry the cutting edge more than three millimetres from the line of the central axis of the shaft, should be contra-angled.

Contra-Angle.—The shank of the instrument is first bent backward (from the direction of the cutting edge), and nearer the cutting edge another bend is made forward,—this length forming the blade, the object being to form a long blade, the edge of which will be near the central line of the shaft.

Binangle-Contra-Angle.—A contra-angle formed by two angles as described under contra-angle.

Triple-Angle-Contra-Angle.—In an instrument of the angle of twelve centigrades or less (about forty-five degrees), the binangle-contra-angle will bring the cutting edge sufficiently near the central line of the shaft, and at the same time carry the shank sufficiently out of the way to permit the use of the full length of the blade; but in instruments of a greater angle, a binangle would not do this, therefore a triple-angle-contra-angle must be made; this is done by first bending the shank backward as in the binangle-contra-angle and then forming another angle which will bring the remainder of the shank parallel with the shaft; then passing forward a space of more or less length as may be required, another bend is made forward by which the blade is formed. In this way the cutting edge of a long blade is brought sufficiently near the central line of the shaft for effective work, and the shank carried sufficiently out of the way to permit the full use of the length of the blade.

Long blades that require contra-angling are mostly for use in places where a long reach of blade is necessary.

There are a number of other subclass names that have been applied to excavators, but as none of them will be used they will be passed by for the present. Also, there are a number of subclass names applied to plugger-points, as cork-screw, cow's horn, bayonet, etc., but as we shall not fully consider pluggers in this paper, they will also be passed.

Curves occur among the rights and lefts or double plane instruments for which no distinctive names have been developed. Those forms which I designate as spoons have a curve beginning at about one-third the length of the blade and gradually increasing to the cutting edge. Another form often seen, but which now seems to be in less favor, is what I should term the hoe spoon. This blade is straight like that of a hatchet until near the cutting edge, when it is bent laterally at an angle, and the cutting edge rounded as in the spoons. These are in pairs, as the spoons, and are true double plane instruments.

Other forms that have been used are almost endless, many of them without names, and very generally have disappeared under the law of unfitness for the purposes intended.

RULES FOR CONTRA-ANGLING.

Recapitulation.

1. All blades, the angle and length of which will bring the cutting edge more than three millimetres from the central line of the shaft, should be contra-angled.
2. All instruments with angles of twelve centigrades or less, when requiring contra-angles should be binangle-contra-angles.
3. All instruments with angles of more than twelve centigrades, when requiring contra-angles should be triple-angle-contra-angles.
4. When the contra-angle is used the cutting edge of the instrument should be brought within two millimetres of the central line of the shaft, or better, when the contra-angle is used the working edge should be brought just so near the central line or shaft that when the instrument is laid edge downward upon a plane surface the edge should just touch, but not actually rest upon the surface.

PART II.

FORMULA NAMES.

The names which have thus far been developed are sufficient for the designation and easy recognition of instruments belonging

to any order, suborder, class or subclass. They are not sufficient, however, for the recognition of the individual instruments of any one of these divisions of forms. The blade of a hatchet or hoe excavator may have an angle with its shaft varying from a slight inclination to a quarter of a circle, or even more. Any angle of blade between these may be effective for some particular operation. A similar variation occurs in the widths and in the lengths of blades. An examination of the excavators on sale in our dental depots shows that the widths of blades vary from two-tenths to fifteen-tenths millimetres. The lengths of blades vary from two to about ten millimetres. Any width or length between those mentioned may be effective in some particular operation.

Now, any of the widths may be combined with a great diversity of lengths, and these again may be combined with a great diversity of angles. We readily see that in this way we arrive at a vast multitude of slight variations in these instrument forms, and any attempt to specify individual instruments without some rules for limiting the number becomes hopeless.

I took up this matter as a subject of study a number of years ago, with the thought that these instrument forms, or a sufficient number of them, could be specified by formulæ, as is done generally with mechanics' tools; as the quarter-inch auger, half-inch chisel, etc. In this study I was at first led into a very complicated system of measurements, which I considered too complex to introduce into school work. But the need of some available system has been so constantly apparent that the subject has not been allowed to rest. Work has been renewed at intervals with each new thought obtained; and finally the idea of a strict limitation of instrument forms in breadths, lengths, and angles of blades has been arrived at. The carpenter will not buy an auger or a chisel that has not been made to a definite formula,—a definite measurement. This is true of mechanics' tools generally. They are all made to specified formulæ. It may be said that the mechanic's drills are made to definite formulæ in order that he may fit bolts made to similar definite formulæ, and that the dentist does not do this. True, but the mechanic also uses these formulæ in naming both his drills and his bolts, that he may know them. Why should not the dentist have his instruments made to definite formulæ in order that he may know them, and designate the one fitted for a special act in excavating? Why should he have an infinite variety of forms without definiteness? No one dentist uses such a variety. Why should we not agree upon definite angles of the blades of hatchet

and hoe excavators and combine with these angles definite sizes, or widths and lengths of blade? In this way we may gain a sufficient number of forms of cutting instruments and rule out all others. And then the thought has also come to me of arranging these in definite sets, in which the formula names shall run on definite gradations for all of the instruments of each set, and in this way so construct them that they will be easily learned and remembered by students.

A strict study of the subject from this stand-point develops the fact that we do not need more than three, or at most four angles. Now, with each of these three or four angles we will combine one long blade of definite width, one medium length of definite width, and one short blade of definite width, stipulating that the lengths and widths shall be the same in each angle. This makes a set of hatchets—if three angles be used—of nine instruments, and a set of hoes of nine instruments, or eighteen instruments in all. These we may name the set of ordinaries. (See list of formulæ, No. 4.) With this limitation of widths and lengths and angles of blades, and the regular order in which they occur, the difficulty of learning to know them by formulæ is reduced to a minimum. Indeed it is found in actual practice that the forms are known by sight as quickly as this simple list of formulæ is learned.

I have chosen and had made some sets of instruments upon this idea, and find from actual use that three angles is quite enough for my personal use. It is necessary only to add a list of spoons, enamel instruments, and a few long blades for reaching into deep cavities, to make the set complete. A list of special forms for special uses, the formulæ for which are constructed upon a similar plan.

It will be seen now, I think, that the infinite variety of widths, lengths, and angles of blades without definiteness or restriction of any kind, except the fancy of those ordering instruments, is responsible for the chaotic condition of the forms of cutting instruments. It is my belief that for school work a strict limitation of instrument forms to those that may be accurately designated is desirable.

SELECTION OF SYSTEM OF MEASUREMENT.

If we have decided that a system of formulæ based upon measurements of widths, lengths, and angles of blades is desirable, the next point will be to agree upon the particular system of measurement to be adopted.

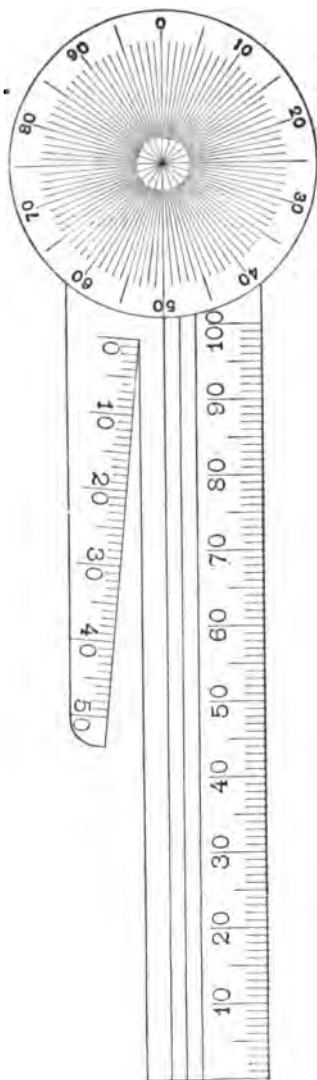
For the measurement of widths and lengths we have the English inch and the French millimetre. Of these I should choose the French system, for two reasons. *First*, from the present indications

it seems that it will in time become the only system employed in scientific work. *Second*, the length of the unit seems much more convenient for the work; particularly is this the case if we use tenth of the millimetre for all measurements of breadths and the millimetre for all measurements of lengths of blades. This seems to be so evident that I have adopted this, pending discussion.

The adoption of a system of graduation of the circle for the measurement of angles is a graver problem. The astronomical circle with its graduation of 360 degrees is far in excess of our needs and becomes cumbersome, because of the minuteness of its subdivisions. On the other hand, it is the division of the circle most used and best known. The mariner's compass with its division of the circle into 32 points seems insufficient. The division of the circle into 100, the centigrade circle, seems very much better suited to our needs. In this, 25 centigrades is a quarter of a circle, and equal to 90 degrees of the astronomical circle. The quarter circle is about all that we use, and the graduations of this are much more quickly caught and appreciated than in the larger number of divisions. I shall use this pending further discussion.

THE GAUGE.

With the view of making the preparation for this work as nearly perfect as possible, I have had a gauge made in steel for instrument measurement. It consists of a circular head graduated in hundredths, and an attached bar ruled in parallel lines for the measurement of angles. The bar is also graduated in millimetres for the measurement of lengths. For the measurement of



widths a supplemental bar extends beside the main bar, leaving between the two bars a gradual widening or V-shaped space, which is graduated in tenth-millimetre widths up to fifty-tenths or five millimetres. This is found very convenient for the measurement of widths of blades, the sizes of plugger-points, and the diameter of burs.

FORMATION OF FORMULA NAMES.

For the formation of formula names of excavators, three points are considered,—viz., the width of the blade, the length of the blade, and the angle of the blade with the shaft. All other points are left to be guided by the rules that have been given in Part I. These (width, length, and angle of blade) are exactly the points that go to make up the individuality of the several instruments of any order, suborder, class, or subclass, and will certainly identify each. The particular conformation of the shanks and the handles are left to the individual manufacturer, or to the taste of the person ordering instruments. Neither is it considered important to this system that the angles be made sharp and definite, or that they be made in the form of moderately short curves. All such points in construction can be left to the taste of the manufacturer. At least the system now proposed does not take them into consideration.

THE MEASUREMENT OF INSTRUMENTS.

In the measurement of instruments for the formation of formula names, first try the width of the blade in the V-shaped slot of the gauge, which will give the width in tenth-millimetres, and set this down as the first figure of the formula. In this the tenth-millimetre is to be used as the unit. Next measure the length of the blade from the centre of the angle to the cutting edge in millimetres and set that down as the second figure of the formula. In this the millimetre is used as the unit. Third, find the angle of the blade with the shaft and set that down as the third figure of the formula. In making this last measurement, lay the handle of the instrument on the main shaft of the gauge, parallel with the parallel lines, and with the point turned towards the small numbers of the circular head. Now move the instrument until the angle of the blade coincides with one of the lines graduating the circle, being careful to keep the handle parallel with the parallel lines.

If we have measured a hatchet and the numbers give, width, 12; length, 5; angle, 6, the formula name will read "Hatchet, 12-5-6." If it be a hoe, the formula will be the same, and we call the instrument "Hoe, 12-5-6," the class name always preceding

the formula name. This distinguishes both the kind of instrument and the size and angle of the blade of each. In this way we name each instrument of the set, no matter what its class and size, as "Spoon, 20-9-12" or "Spoon, 15-8-12," or "Enamel Hatchet, 15-8-12," or "Enamel Hatchet, 10-6-12," etc.

It is also understood that the edge of cutting instruments shall be at right angles with the length of the blade, unless otherwise specified. When some other angle is desired, it is measured in the large numbers in the last quarter of the graduated circle by moving the instrument without turning it over, and still keeping the handle parallel with the parallel lines of the gauge until the angle of the edge coincides with one of the centigrade lines, and that number is set in parenthesis following the width number, thus, gingival margin trimmer 20 (95)-9-12 or gingival margin trimmer 20 (80)-9-12.

FORMING INSTRUMENT LISTS.

We have now made out rules of nomenclature by which we may accurately designate individual instruments. I will now explain the scheme for grouping instruments in formula lists which serve to limit the number of forms and to bring those chosen into intelligible order. The appreciation of value of regular order in the formation of instrument sets has been arrived at rather slowly, and largely from studying the difficulties of students in learning the forms of their instrument points. With the methods that have prevailed few persons learn to think in their instrument forms. They have to search for the proper instrument instead of reading it in the case before them. It is that we may be able to teach pupils to think in their instrument forms that we strive to construct graded sets in formula nomenclature; and these should be placed on such lines of gradation, or be so grouped, that the mind easily follows from one to another throughout the set.

It is not difficult to do this with any of the forms of excavators, but some of them are more easily arranged than others. The ordinary hatchets and hoes present the greatest variations of size and angle of blades, but fortunately are the most easily graded into sets. Carpenters' augers are made in gradations of sizes of one-thirty-second inch, making the most perfect set. Another set is made on gradations of one-sixteenth inch, this set containing but half the number of the first. Still another set is made on gradations of one-eighth inch, containing but one-fourth the original number. Yet each of these sets is complete upon its individual lines and each of the smaller sets is contained in the larger.

For the ordinary hatchet and hoe excavators we may readily do a similar thing by first constructing a list of a formulæ on regular gradations that will cover the useful sizes and angles of blades, and then cut out all of certain dimensions or angles in the formation of shorter lists. This is not so readily done in spoons, enamel hatchets and some other forms, for the reason that in these we do not require so many instruments of a given class. These also require different formula names, for the reason that the blades are of different dimensions from those of the hatchet and hoes. They must therefore be placed in a different formula list in which we can group together such instruments as agree in dimensions of blade. If necessary we may make several formula lists. At present I will propose three divisions, naming each as follows:

Ordinaries are the common forms of hatchets and hoes, many of which are found in every operating-case.

Specials are those instruments designed for special acts in excavating, such as spoons, enamel hatchets, chisels, etc.

Side Instruments.—These are selections for some particular purpose, only one or two of which are wanted in the instrument set, and which it is not desirable to include in a regular formula list.

ORDINARIES.

After a long and careful study of the dimensions, proportions, and angles of blades of the hoe and hatchet excavators used by dentists and generally on sale in dental depots, I am of the opinion that nearly or quite every dentist will find in the following formula list about everything he will want:

SET OF ORDINARIES, NO. 1.

14-6-6, 12, 18, and 23.

12-5

10-4

8-8

6-2

4-1

forty-eight instruments.

Formula lists for ordinaries will be given in this form. The first figure gives the width of blade; the second the length of blade; the third the angle of the blade with the shaft; and the additional angles used are given in the first line only, divided by commas.

Each of the dimensions of blade is to be made in each of the angles given both in hatchets and hoes. The list is to be read:

Hatchet 14-6-6, hatchet 14-6-12, hatchet 14-6-18, hatchet 14-6-23; or, hoe 14-6-6, etc, for the first line; and hatchet 12-5-6, hatchet 12-5-12, hatchet 12-5-18, hatchet 12-5-23; or, hoe 12-5-6, etc., for the second line. This is continued in the same way for each of the dimensions of blade. *The formula of each instrument is stamped upon its handle as a convenience to the student in learning his instrument points.*

According to the rules for contra-angling given in Part I., hatchet and hoe 14-6-12 would be binangle-contra-angles. Also hatchets and hoes 14-6, 18, and 23.

12-5

10-4 would be triple-angle-contra-angles.

There are in the set twenty-four hatchets and twenty-four hoes, or forty-eight in all, and, if generally adopted as the full list of ordinaries, would, I think, be found satisfactory.

In making shorter lists I would cut out all of certain dimensions of blade, or of certain angles, preserving the regular order of formula names for those retained. As the least desirable I would first remove all of dimensions 14-6 and 4-1, thus:

SET OF ORDINARIES, NO. 2.

12-5-6, 12, 18, and 23.

10-4

8-3

6-2

thirty-two instruments.

This set is a most beautiful gradation of the ordinary forms of excavators, and really embraces about all that any dentist would want in his case. But these are probably a greater number than most persons would desire.

For the next set I would remove all of the dimensions 10-4, thus:

SET OF ORDINARIES, NO. 3.

12-5-6, 12, 18, and 23.

8-3

6-2

twenty-four instruments.

This is also a very effective instrument set, but if there are still too many I should remove all of the angle eighteen centigrades, thus:

SET OF ORDINARIES, NO. 4.

12-5-6, 12, and 28.

8-3

6-2

eighteen instruments.

This I regard as an especially desirable list for school work. It is the list I have used most except that I have used the dimensions 5-2 instead of 6-2, but in the future will use the 6-2.

Now, for a still shorter list, and the shortest that I could recommend as reasonably efficient, I would retain but two dimensions :

SET OF ORDINARIES, NO. 5.

10-4-6, 12, and 28.

6-2

twelve instruments.

This is a list of six hatchets and six hoes excellently graded to the requirements of the student,—indeed I do not know how we could better select this number of instruments.

In the instrument sets given we have five, differing widely in numbers, but in each the formulæ are complete on the lines laid out, and every instrument is a good one. The smaller sets are all contained in the largest, and are so arranged as to give manufacturers the least trouble in supplying classes. If manufacturers will make up List No. 1, or even List No. 2, and make these their stock instruments in ordinaries, there are few wants in this line that will not be supplied by them. From them any school that may desire to introduce the formula plan of nomenclature in teaching will be able to choose a satisfactory list. Within a few years this may become the plan of the dental profession, and the manufacturers will be relieved from the loads of dead instrument stock they are now compelled to carry. That other instruments in this line will be demanded goes without saying, but they will be fewer in number as discussion of plans and methods under conditions of greater accuracy of understanding proceeds.

SPECIALS.

In the list of specials I will give such only as I have defined in Part I. These seem to me from my personal study and use of cutting instruments to be best suited to our present methods of preparing cavities. I will first give what I regard as a complete list, and afterwards cut it down to smaller numbers, removing such

instruments as can be spared with the least detriment to effective school work. It is to be understood that each full instrument set is to contain a list of ordinaries and a list of specials. The list of specials will contain numbers of classes instead of a great variety of sizes and angles of two classes, as is the case with the ordinaries. We do not require many sizes and angles of blade in any one class of specials. After a careful study of them it is found that most of them may be arranged upon practically the same formula numbers. There are a few, as the straight chisels and the cleoids, which will not require the full formula terms to sufficiently designate them. Three widths of blade seem to me to be the most that will be necessary, and nearly all may be of the angle twelve centigrades, a few only requiring the angle six centigrades. The length of blade may be on the same lines in all but the discoids, the length and breadth of which are necessarily the same.

LIST OF SPECIALS, NO. 1.

Enamel hatchets	20-9-12 Pr. R. & L. bevels.
Enamel hatchets	15-8-12 Pr. R. & L. bevels.
Enamel hatchets	10-6-12 Pr. R. & L. bevels.
Spoons	20-9-12 Pr. R. & L. curved.
Spoons	15-8-12 Pr. R. & L. curved.
Spoons	10-6-12 Pr. R. & L. curved.
Spoons	20-9-6 Pr. R. & L. curved.
Spoons	15-8-6 Pr. R. & L. curved.
Spoons	10-6-6 Pr. R. & L. curved.
Gingival margin trimmers	20 (95)-9-12 Pr. R. & L. curved.
Gingival margin trimmers	20 (80)-9-12 Pr. R. & L. curved.
Gingival margin trimmers	15 (95)-8-12 Pr. R. & L. curved.
Gingival margin trimmers	15 (80)-8-12 Pr. R. & L. curved.
Binangle chisel	20-9-6. One instrument.
Binangle chisel	15-8-6. One instrument.
Binangle chisel	10-6-6. One instrument.
Straight chisel	20. One instrument.
Straight chisel	15. One instrument.
Straight chisel	10. One instrument.
Discoid	20-2-12.
Discoid	15-1½-12.
Discoid	10-1-12.
Cleoid	20.
Cleoid	15.
Cleoid	10.
thirty-eight instruments.	

This gives a list of thirty-eight special instruments. Several other forms might be added, but to me they seem unnecessary.

They can be added, however, upon the same plan of formulæ used in this list, or if necessary still another formula list may be arranged. This list will give rise to more difference of opinion than the list of ordinaries, for the reason that they are designed for special uses in excavating, and persons who excavate cavities differently are likely to want different special forms. Such differences, however, have no reference to the formula plan of nomenclature, as other forms can as readily be brought into this system.

In this list of specials each instrument is designed for the performance of a special act in excavating. The enamel hatchets are designed for chipping enamel by hand-pressure in opening cavities in the bicuspid and molars. They are bevelled rights and lefts and are somewhat distinctive in form and use. When the manner of handling them and their adaptation to place of use has been learned, they are unusually effective instruments. Indeed, besides their use in chipping enamel, they become the principal instruments for cutting out and forming both mesial and distal cavities in the bicuspid and molars, both upper and lower. Their angle of blade and form of edge is such that they naturally cut these cavities into proper form. And when properly supplemented by burs, they are very effective in extending these cavities for the prevention of the recurrence of decay at the gingival margin, or at the bucco-gingival and linguo-gingival angles.

The spoons are for the removal of carious or softened material in any position, but more especially in the large cavities in the bicuspid and molars, also for uncovering exposed pulps the broader blades are invaluable. Of these spoons the pairs in twelve centigrades angle seem to be preferred, though the six centigrades angle are the instruments heretofore generally in the market.

The gingival margin trimmers, two pairs of which are of one size, and another two pairs of another size, are for the one purpose of smoothing and bevelling the marginal angle of the gingival wall in proximate cavities in the bicuspid and molars. For this purpose they have the cutting edge ground to a definite angle with the shaft. This is made eighty centigrades in the one pair, which fits them for mesial cavities, and ninety-five centigrades in the other pair, which fits them for distal cavities. The smaller pairs serve this purpose in places too narrow for the entrance of the twenty-tenths width of the larger. These are the only instruments in the list that have cutting edges other than at right angles with the length of the blade.

Of chisels I have placed six on the list. Three of them are

straight, and the width of blade only is given in the formula name, as chisel 20, or chisel 10. All have cutting edges at right angles with the shaft. Those designated as "binangle chisels" have the full formula name with an angle of six centigrades. They are so contra-angled as to bring the working edge in the line of the shaft. The six form a very effective set for chipping enamel in the opening of cavities, and in trimming the walls to form. The angles of the binangle forms adapt them admirably to the trimming of buccal walls in molars and bicuspidis in places where a slight angle of blade is necessary to reach the best position for cutting.

The discoids perform much the same office as spoons, and are available in positions of easy access. When direct access can be had, they are to be preferred.

The cleoids are available for almost any purpose demanding a pointed instrument. I use them much in opening pulp-chambers in upper bicuspidis, and in bevelling lingual enamel margins in incisors, also frequently in following out fissures in the molars.

In forming sets of these of fewer numbers I would first cut out the list of spoons in six centigrades angle; second, the list of cleoids, and third, the discoids; fourth, the gingival margin trimmers 15 (95)-8-12 and 15 (80)-8-12, leaving the list stand thus:

SET OF SPECIALS, NO. 2.

Enamel hatchets	20-9-12 Pr. R. & L. bevels.
Enamel hatchets	15-8-12 Pr. R. & L. bevels.
Enamel hatchets	10-6-12 Pr. R. & L. bevels.
Spoons	20-9-12 Pr. R. & L. curved.
Spoons	15-8-12 Pr. R. & L. curved.
Spoons	10-6-12 Pr. R. & L. curved.
Gingival margin trimmers	20 (95)-9-12 Pr. R. & L.
Gingival margin trimmers	20 (80)-9-12 Pr. R. & L.
Binangle chisel	20-9-6.
Binangle chisel	15-8-6.
Binangle chisel	10 6-6
Straight chisel	20.
Straight chisel	15.
Straight chisel	10

twenty-two instruments.

For a still shorter list, and the shortest list of specials that I could recommend, I would cut out from Set No. 2 all of the dimensions 10-6, thus:

SET OF SPECIALS, NO. 3.

Enamel hatchets	20-9-12 Pr. R. & L. bevels.
Enamel hatchets	15-8-12 Pr. R. & L. bevels.
Spoons	20-9-12 Pr. R. & L.
Spoons	15-8-12 Pr. R. & L.
Gingival margin trimmers	20 (95)-9-12 Pr. R. & L.
Gingival margin trimmers	20 (80)-9-12 Pr. R. & L.
Binangle chisel	20-9-6.
Binangle chisel	15-8-6.
Straight chisel	20.
Straight chisel	15
sixteen instruments.	

This list is really quite effective, though one who has become accustomed to the smaller sizes will miss them.

Of these lists, No. 2 of the specials combined with No. 4 of the ordinaries makes an excellent set for school work. It contains thirty-four instruments, every one of which will come into active use in the ordinary infirmary practice.

Also set of specials No. 3 combined with set of ordinaries No. 5 makes a well-chosen short set of twenty-eight instruments that is quite effective for school work, though some very desirable instruments are missing.

These lists are extremely simple in their formula nomenclature and are easily learned by pupils. Of course, other combinations of these lists may be made at will. Yet it is important that the direct relation of the formula names be carefully maintained in any lists made up for school use.

SIDE INSTRUMENTS.

Side instruments should be made to definite formulæ, that they may receive definite names. For instance, in breaking up the list of specials for the formation of smaller lists, discoid 20-2-12 may be retained as a side instrument, or one of the cleoids may be retained. I like to have in the instrument list as side instruments hatchets 5-3-28 and 3-2-28 for cutting retention grooves in the incisal angle of incisor cavities. It will be noticed that the formulæ of these latter do not follow the lines of the list given. The number of such instruments added to working sets in schools should be limited to a very few favorite forms for some special use. Any considerable number of them will certainly cause confusion in the minds of students, and interfere with the easy mastery of the list as a whole.

Other formula lists may be added when desired. This year I have used an additional list of long slender blades expressed thus:

Hatchets and hoes 12-8-12 and 23.
8-6.

Of these, the blades in 12 centigrades angle are most excellent instruments for deep cavity work, and yet my experience thus far in teaching leads me to the conclusion that the introduction of this third formula list is undesirable. In other words, instruments in the other two lists so nearly take the place of these that it seems undesirable to burden the students with the additional list.

There is really no limit to the number of lists that might be formed by this method, and if I have now made this clear I have finished my task in this direction. But the more important consideration is the limiting of the instrument forms to definite lines easily followed by the student and readily supplied by the manufacturer.

It must be distinctly understood that in ordering instruments by the formula plan the class name of each instrument must be given with its formula,—as hatchet 12-5-6, or spoons 20-9-12.

It seems very desirable that some rule be established as to which instrument shall be called the right or the left in the instrument pairs. I will suggest that this be based on convenience of use in the right hand. That blade which, when held as a pen with the point downward, has the convex side of the blade to the right is called the right-hand instrument; and the blade which has the convex side of the blade to the left is the left-hand instrument. In bevelled rights and lefts the bevelled side corresponds to the convex side of curved blades.

TEACHING INSTRUMENTS AND INSTRUMENTATION.

When the time came for opening school this year, I felt that I could not begin without putting the plan for formula names to trial. The teaching of the mechanical forms, the adaptation of forms to the ends to be accomplished, and plans of instrumentation were begun in Northwestern University Dental School this year under extreme disadvantage. It was really impossible that it should be otherwise in the beginning. It has come upon a class of three hundred and fifty pupils—juniors and seniors—after they have accomplished a part of their course by other methods, and with instruments of different forms. To make matters worse, on account of the slowness of manufacturers, together with the ex-

traordinary demand for the particular instrument set used, only a portion of the pupils could be promptly supplied. This has been a great drawback to effective work. Yet the experience gained thus far has been a most valuable study of the effectiveness of the method and of the plans to be employed in teaching. Most pupils who obtained their instruments in time learned to read their points readily and have made rapid progress in instrumentation.

The proper place to begin this teaching is in the operative technic class; and for this purpose the pupil should be required to obtain his cutting instruments in his freshman year. One of the first and most important steps is to give the pupil a good working knowledge of the value of the millimetre, of tenths of a millimetre, and of centigrade angles. He should attain this in such degree that he will be able to cut bits of paper, or of some soft metal, five-, ten-, or fifteen-tenths millimetres wide, or five or ten millimetres long with reasonable accuracy without the use of the gauge; and to form any given angle. In this study he must first work with the gauge or with the printed form. A very excellent study for this study is the Boley gauge, an instrument that is specially well adapted to measuring teeth, and many other things in school work and in the dental office. As this is being accomplished the instrument forms are presented one by one, as hatchets, spoons, hoes, etc., and the mechanical features of each, the nomenclature of its different parts, and the relation of the instruments to each other explained. The capabilities of each form will be familiarized by exercise in their use in carving in bone, and forming cavities in teeth. In doing this, correct instrument grasps, and finger and thumb rests, will be taught. The pupil is then presented with the various sizes of each form, and learns to distinguish them and to use their formula names.

In this way the pupil becomes fitted to enter the junior year in which this teaching begins to be put into actual practice in the mouth. Now a review of the instrument forms, their nomenclature, and the uses of each, is made in connection with the teaching of the preparation of cavities. In this the lecturer and the demonstrator at the chair becomes able to direct the student effectively, so that his use of instruments is begun correctly, and comparatively rapid progress made on right lines. This much neglected branch of operative dentistry, instrumentation, can now be taught effectively.

Cavity preparation, in my conception of it, should proceed in a definite order, step by step, which a student should be taught to observe strictly, to carry out with certain instruments, and with

fairly definite methods of instrumentation. It is only when he is able to accomplish this work upon a definite system that he should be regarded as able himself to form his lines of procedure in such a manner as will lead him to that degree of skill in the future which we desire that our pupils should attain.

Reports of Society Meetings.

THE NEW YORK INSTITUTE OF STOMATOLOGY.

A REGULAR meeting of the Institute was held Tuesday evening, March 1, 1898, at the residence of Dr. W. E. Hoag, No. 8 East Forty-third Street, New York City, the President, Dr. E. A. Bogue, in the chair.

The minutes of the previous meeting were read and approved.

Dr. J. A. Bishop exhibited an under plate which he thought had been worn about thirty years; he showed also a wisdom tooth that he had taken out with a string a few days before. This tooth had a large gold filling which was put in about thirty years ago by one of Dr. Atkinson's fine operators. The dentist had supported his gold filling with a little gold screw anchored in one of the roots, and the end of the screw extended beyond the apex of the root.

The President.—I believe some committees are to report. Has Dr. Allan, of the Committee on Operative Dentistry, anything to report?

Dr. George S. Allan.—Cataphoresis, which came into favor two or three years ago with a great flourish, has occupied much attention and consumed a great deal of time. While it has not gone entirely out of favor, it has seemed to fall behind, and many operators who at one time were enthusiastic about it, if asked if they use it as much as they formerly did, will frankly say, "No." The main reason given by most of these operators for giving up in some degree its use has been that it takes too much time and gives too much trouble. Most of the bother and trouble comes from the lack of quickly applied electrodes; therefore any electrode which meets the want indicated, which facilitates the use of the electric current in cataphoresis, ought to be known at once and exhibited. So far as I know there has been no advance made in the electrodes for the negative pole of the battery since their first introduction until

this one was brought to my notice a few days since by Dr. Waite, of Waite & Bartlett. It is the result of the combined ingenuities of Drs. Kells and Van Woert, of Brooklyn, and is simplicity itself. It consists of U-shaped tongs, one end of which is a platinum bulb and the other a simple piece of rubber. The arms are about three inches long, the platinum bulb being about one inch long, one-fourth inch wide, and one-eighth inch thick. The mode of application is simply to put the platinum bulb against the inside of the cheek and the rubber on the outside. It does away at once with all bother of placing the cathode on the wrist or side of the face or elsewhere. It struck me as so valuable that I decided to bring it to the notice of the members of the Institute.

Another point Waite & Bartlett have introduced—whether they were the first or not to do so I cannot be certain—is having the two wires attached to the negative and the positive poles combined for most of their length, so as to do away with the annoyance of two separate wires. The double cord is composed of two cords, the green and the red, and they separate where they connect with the battery, and they separate again at the other end. A suggested improvement is that this cord be attached to a wheel that will unwind and wind on the principle of an ordinary curtain shade. The battery being in front of the operator, when he wishes to use it he simply pulls the rubber cord forward as he would pull down a shade, springing it back when he is done with it. In addition, I wish to show an electrode which I devised some time ago and have found exceedingly useful for attaching the anode pole to the teeth, so that both hands may be free. The anode end of the cord consists of a platinum wire which passes through a socket and can be clamped in position by a set screw. The socket in turn is attached to a bar with a flat pad below it. In use the pad is covered with modelling composition, and this last, after softening, is tied by a ligature to the adjoining teeth. All is then fixed in place. These little things make the use of the cataphoric current much more certain and greatly shorten the time of getting ready.

The President.—Will Dr. Allan kindly inform us how soon insensibility takes place after those electrodes are in position?

Dr. Allan.—In from ten minutes to half an hour.

The President.—Will Dr. Allan also inform us whether insensibility is induced cataphorically when the cavity is exceedingly shallow, barely penetrating the enamel?

Dr. Allan.—Yes, but very slowly. One cannot always tell by the symptoms the patient manifests whether the current is doing

its work or not. Oftentimes the physical symptoms are wholly negative.

The President.—The Committee on Current Literature will now report through its chairman, Dr. Elliott.

REPORT OF COMMITTEE ON CURRENT LITERATURE.

Dr. W. St. George Elliott.—Among the most important questions which have arisen in the last six months are those introduced in the pathology of enamel by Drs. Andrews and Williams. It is desirable that we should have a clear comprehension of the points at issue between these two gentlemen. It has been noticed that our distinguished Society received a rather severe rap in the last number of the *Dental Cosmos* from our friend Williams, who thinks we assume to be the profession.

It would seem that the fundamental difference of opinion between these gentlemen is largely one of nomenclature. Dr. Andrews defines the enamel organ proper, when the organ is in its perfect state before calcification commences, and that a plexus of blood-vessels is not developed in an epithelial mass, while Dr. Williams speaks of the developing blood-vessels appearing in the stratum intermedium at an early stage in the formation of the tooth, or the enamel organ proper of Dr. Williams is the organ after calcification commences.

They both agree that the blood-vessels are developed from the connective tissue of the jaw, and that they are found in and near the stratum intermedium after calcification commences. Dr. Williams considers the stratum intermedium to be a glandular structure, while Dr. Andrews does not. Doubtless they differ as to what a glandular structure is, for they both agree that the apparent function of the stratum intermedium is to select nutriment from the blood for the use of the ameloblasts. Dr. Andrews holds the opinion in regard to the outer ameloblastic membrane, that it is not always present and may be a post-mortem appearance, while Dr. Williams generally finds this membrane in his specimens, and thinks it may be due to activity of the cells of the stratum intermedium beyond the capacity of the ameloblasts to absorb the material for calcification. They both agree as to the physical character of the structure; that it is a collection of fibres containing another substance in their meshes, which by one is supposed to be the protoplasm of the cells, by the other to be a product of the protoplasm. As to the inner ameloblastic membrane, one calls it the epithelial protoplasmic fibre, and the other plasm string.

They agree that the membranes, when present, are of a fibrous nature, having the appearance of a distinct substance and showing a definite reaction to certain stains.

Globules, which go to make up the enamel rods, are found in the ameloblasts. One gentleman calls them calcific globules, and the other enamel globules. They are deposited in, or there is simultaneously another substance formed, called by one protoplasmic exudate, by the other calcoglobulin, which forms in one instance the inter-rod cement, in the other the inter-prismatic substance. The organic scaffold is formed in one case by the epithelial fibre, in the other, plasm string. The steps in the process seem very much the same in both cases.

In the *Dental Digest* for January Dr. G. V. Black has a paper on Instrument Nomenclature, in which he has made a bold attempt to classify all our instruments. Whether his views will ever be generally adopted or not is a question. Yet the mere agitation of the matter will do much good. Let us hope that even we may live to see the day when students will be taught not only what instruments to use in a given case, but just how they should be used. Skill is a matter of labor and study. Mechanics are not usually made in a day. Some are born, but the vast majority acquire skill only by much patient effort and close study. The fault with most dental colleges in this matter is that more attention is paid to the shaping of the cavity than to the proper instruments to be used in its preparation and the proper manual with the instruments. The great majority of the profession develop a system of their own, and, good or bad, they stick to it through life, for, perchance, they know no other. The time taken to perform a specified operation varies with the operator, and is often two or three hundred per cent. Why is it? Two men will perform the same identical operation. One will take twice as long as the other, and why? Because there is no uniformity, no system in our procedure, no proper training. One uses a hoe, another a hatchet, and a third an engine, to do the same thing; and yet there is but one best way. Pardon this digression. Dr. Black would classify instruments and divide them into order names, as excavators; suborder names, as hand-plugger; class names, as hatchets; subclass names, as bayoneted plugger. Right and left hatchets he calls double-plane instruments, etc., and when the good doctor tells us of triple-angle-contra-angle, we get lost.

Some fifteen years ago I read a paper before a society at Ostend, Belgium, on "System as applied to Instruments and Books," in

which I described the system I then used and now use. Briefly, with instruments it consisted of confining myself chiefly to hoes and hatchets, right angle and oblique, ten sizes of each, making a total of forty. All right angles were ninety degrees, and all obliques were forty-five degrees. These are in racks, and as the handles are in colored celluloid, the character of the instrument is seen at a glance,—red for hoes, and blue for hatchets. Pluggers are too complex in character to reduce them to a practical system.

In the *Dental Cosmos* for August, in the proceedings of the Dental Society of the State of New York, there is a report of the committee on Dr. Black's work, which is most interesting. Twenty-four fillings of amalgam were made by different operators; these were tested under Dr. Black's supervision, with the following results: three were perfect, sixteen shrank, and five expanded. Shrinkage was from one to sixteen points, Dr. Black's point being the $\frac{1}{1000}$ of an inch. The microscope (one-half inch objective) was used as a check. Should an error arise in the manipulation, it would probably be detected by this means. Two of the operators used gold to take up the excess of mercury and prevent shrinkage, which it failed to do. Dr. Black has accomplished two things, but think of the amount of work and the years of time it has taken to accomplish this! He has experimentally proved what are the proper metals and what the proper proportions of each, and that all alloys should be annealed. The proportion of silver and tin is seventy-two to seventy-four per cent. of silver and the balance tin, and that the annealing should be at 120° for three or four days, this giving a more plastic mass than when the annealing is done in boiling water for fifteen minutes. One of Dr. Black's own formulæ, silver, 68½; tin, 25½; gold, 4; zinc, 1; and bismuth, 1, gave perfect results.

An important question arises here as to how much contraction may be considered unimportant. Dr. Black's instruments measured up to the $\frac{1}{1000}$ of an inch. But any one who is at all accustomed to work with even the B. & S. micrometer, measuring with fair accuracy up to $\frac{1}{1000}$, will recognize the skill required to work up to $\frac{1}{1000}$. The average micro-organism, we will say, is about the $\frac{1}{1000}$ of an inch, while the instruments would fail to detect a shrinkage of less than $\frac{1}{1000}$. Surely the organisms could hardly ask for more room, a more open door than they might have, and yet the margins pass muster as being perfect.

While this is true on theoretical grounds, do not forget the great gain we as a profession have made in having the shrinkage of our amalgam reduced from eight and ten points to nothing.

As to the proper amount of mercury to use, Dr. Black's rule seems a good one, and experimentally it has proved to be so. Use mercury enough so that the mass will take a good impression of the skin markings.

Why is it that we as a profession are so often treated by the manufacturers of amalgam as if we were children? Each labels his production as perfect, neither shrinking nor expanding, etc., whereas they know or ought to know that they all are unreliable, all shrink. Some years ago I tested by the specific gravity test some fifty different makes, and they all shrank. If they will use a shrinking formula, then let them give us the shrinkage ratio, and we will know what we are using. We do not want any *proprietary* make. We want the proper formula, and then give us the guarantee of a reliable house. Few dentists care to make their own alloy, and they are willing to pay a good price for a good thing. We are tired of *empirical* preparations. I might say, finally, that Dr. Black tells us that the amount of mercury present in a filling plays no part in the shrinkage, but a considerable one in the resulting strength.

In the same number of the *Dental Cosmos* Dr. Gillet has a paper on the subject with which his name is so frequently connected,—Cataphoresis. He drew attention to the modified views now held by the profession. Not only do not all medicaments go from the positive to the negative pole, but some go one way and some another. We can readily test the matter for ourselves by using a bit of moistened paper or cloth and placing the material to be tested at each pole and note the direction the color travels, or, if there is no color, by chemical tests. There is practically no improvement in the time required to reduce sensitiveness, from five minutes to half an hour. Secondly, dentine seems to act as a non-conductor. While on this subject I would like to mention the excellent paper by Dr. Price, of Cleveland. The first part of the paper seems to be largely given up to a scientific refutation of the so-called short circuiting the nerve. A matter of importance has been brought out by the doctor's experiments, that with a given current and a given pressure the result was the same whatever the electrode, the pain limit being reached independently of the character of the electrode. Also that different combinations of electrolytes gave the same results.

In the *Dental Cosmos* for November Dr. Stowell has an article on Hydronaphtol. Clinical experience certainly commends this ideal antiseptic. While fourteen times as strong as carbolic acid, it is

neither irritating nor poisonous. It is of great value to us in many ways ; at the same time, we cannot take the rosy view of the matter that Dr. Stowell does, nor do we believe that any drug or any system of treatment can be always successful. Oliver Wendell Holmes used to say, "There is no specific in medicine, if we except quinine in intermittent fever," and it is certainly true in dental medicine.

In the *Journal of the British Dental Association* of December 15 the Dental Manufacturing Company illustrate a slide-backing like the Mason, but sold separate from the tooth, and is thus made universal.

There has been in use in England for some time an apparatus invented by Dr. Hewitt, and now largely used abroad ; it is for the combined administration of nitrous oxide gas and oxygen ; its value has been most thoroughly proved ; but as far as I know it is not used in this country. Again, why is it that in England for many operations outside of dentistry gas is first administered and then ether, getting largely rid of the stimulating and nauseating character of the latter when used alone ? We are certainly a conservative people.

Dr. S. E. Davenport.—It has been noticed that the President, in sending out his list of the Institute's special working committees for the year, has added the names of a number of associate members. Several of the active members, in talking this matter over, have declared it to be a very good idea, as it will cause the associate members to take more interest in the scientific work of the Institute. I will therefore offer the following :

Resolved, That the Corresponding Secretary be requested to send to all associate members the request that they inform the President which committee they prefer to be appointed to.

The resolution was carried.

The President.—I will say that a number of the active members have earnestly requested that such steps should be taken as should cause the associate members to feel that they are on the same level as the active members except in matters appertaining to the government. I am in hearty sympathy with this action, and pleased that the Institute endorses it. It is with pleasure that I announce that Dr. Lord will now describe his method of using soft foil, and give us such demonstration of the same as he well can out of the mouth.

(For Dr. Lord's paper, see page 265.)

The President.—When Dr. Lord uses the word contour, I sup-

pose he does not mean that he restores by absolutely non-cohesive gold a corner, for example?

Dr. Lord.—No; I do not mean that I restore a corner with soft gold. I said in my paper that cohesive gold would be required for restoring a corner or the side of a tooth that had been broken away. In my judgment, fillings are contoured too much beyond what is natural, professedly to prevent the food getting between the teeth; but food will get there, and the secretions also; and as the spaces cannot be thoroughly cleansed bad results follow.

Dr. Kimball.—Are these instruments with grooved lines on them made to draw or to push?

Dr. Lord.—Both; they will cut equally well by drawing or pushing. I have the instruments with me that I have spoken of this evening; but it is not easy to describe some instruments on paper, or even to understand them when they are illustrated. They must be seen and handled to be appreciated or understood.

Dr. McNaughton.—Will Dr. Lord tell us whom he recommends as a good instrument-maker?

Dr. Lord.—One of the best I have ever known is a man named Meffert. He is now in the employ of the Consolidated Company, and it is more difficult to get his services than when he had a shop of his own. It is very difficult to get suitable instruments made these days, and there is no way but for dentists to be able to make quite a good many of their own, as they must always be shaping the points in order to have just what they want.

The President.—It seems to me that our *confrère*, Dr. Kimball, did not quite finish his demonstration at the February meeting, and perhaps he will favor us with some comments on Dr. Lord's communication and finish what he was about to say the other evening.

Dr. C. O. Kimball.—I can hardly say that I did not finish the other evening, because what I read in the little outline paper really covered the ground. I should, however, have liked a little more time for the demonstration, to explain various little matters of detail, just as Dr. Lord has done here, not merely doing them, but explaining why they were done, but owing to the lateness of the hour I had to crowd through as rapidly as possible. The few who were near could see, but those farther away had to take it on faith.

I have listened with the greatest interest to Dr. Lord's explanation and demonstration. It seems to me a wise, intelligent, and thoughtful system, which he has worked out with great care, and I wish to express to him my personal gratitude for so fully and carefully giving us the details of it. I think Dr. Lord is right; our

work is essentially a work of detail, and the successful man is the man of infinite patience and infinite detail. I mean the successful man, not from the business point of view, but from the professional stand-point. And so, when any man comes before us with an illustration of his method of work, we must expect and we want the finer particulars, because it is in those that we differ. We have a cavity, we pack gold in it, but in the minute details of the work are to be found the difference between one man and another.

It is a little difficult to criticise, to discuss clearly Dr. Lord's method without having seen his instruments before and without knowing exactly how each one is used, but the general plan of using the soft foil, of pressing it into the tooth against the walls of the cavity and then condensing it from the surface, I thoroughly approve of, as shown in my own practice, working on the lines of Dr. Dunning's teaching, though of course modified by my own individual feelings and habits of manipulation. Dr. Dunning usually packed every piece firmly as he put it in, and while in some cases I have followed the method Dr. Lord uses, it has seemed to me better usually to condense (to pack, as I call it) the individual pieces of gold firmly and about as solidly and carefully as it can be done with the first direct pressure at the time of putting them in. It is true that it leaves a rather hard surface, but the hardness of the surface of soft foil packed in that way is not so great but that the next piece may be made to stick to it. We call it non-cohesive gold, but I could show many fillings which have been in the mouth for years, and which when taken out showed a surprising amount of cohesion, and where nothing but pure soft foil was used. Dr. Dunning used to say that one of his friends carried in his pocket a gold eagle with a little filling built up on the side of it, using nothing but Abbey's soft foil and fine, sharp points. I have not seen the piece so treated, but it illustrates what can be done with soft foil. We do get a certain amount of cohesion by the working of the gold into the pieces already placed in position.

As for surface condensation, I feel that I am quite at one with Dr. Lord, for when the gold has been packed towards the walls carefully in the first insertion, the condensation does a twofold work. In the first place, by the wedging process in condensation the gold is packed against the walls still more firmly; and in the next place it affords, what is of great value to me, a thorough testing of the filling. I may put in a filling just as carefully as I can, and yet on going over it I find several places where I have to add more gold. It is that going over the surface and condensing and

testing every corner and edge of the filling by which I feel sure when I get through that the surface is solid from edge to edge and that I have achieved the result at which I aimed,—to furnish a water-tight covering for that cavity. It is a cork, nothing more, hard enough to bear mastication.

In condensing, there is one instrument that I use a great deal which Dr. Lord does not, and which I should be very sorry to be without. It is a little bur with a tiny ball head, cut sharp, with a round handle so that it does not chafe the hand. In the middle of this round handle is a section which has a roughened surface. It is tempered just as a plugger is, and I can put any pressure on it that I want to, condensing with the little head, spreading the laminæ to the side until the surface becomes more or less hard. These tiny burs work by rolling the end (forward and backward) over and over, working from the centre to the side and from the side to the centre, being careful not to chip the enamel. This instrument is useful also in the packing of crystal gold; it works rapidly and effectively. A few years ago a friend of mine was filling a tooth in connection with another operator; one was using a serrated point plugger, filling one side of the cavity, and the other was using this little bur, working in crystal gold upon the other side. Years afterwards my friend had occasion to cut through that same filling, and he told me that the side which was packed by the little bur was much more solid and more closely condensed than the other side, which had been packed with the serrated point.

The only other thought I wish to refer to now is the use of the burnisher in filling. In my hands it is a very valuable instrument. I do not, however, use it of the size commonly employed, but much smaller, the head being a ball smaller than the size of the No. 1 bur. After the filling has been condensed with the square point and rolled over with the bur, this burnisher will rub the laminæ together still more, making a hard, smooth surface more impervious to moisture.

I would like to show this flat burnisher with an oblique turn. I have not seen it in any list of instruments, and have found, to my surprise, that it is a new thing to some of my friends. I have used it for many years. It is of almost universal application, the peculiar angle making it possible to use it for many purposes.

Dr. Lord.—I think I may have been misunderstood in regard to the use of the burnisher. I, of course, only had in mind that glossy finish which is so generally given to the surface of fillings and which is of no real value.

But to burnish in order to give further density to the filling and hardness to the surface is of the greatest value; indeed, it is imperative.

The President.—There are certainly a number of members who are accustomed to soft foil filling who ought to have something to say on this subject.

Dr. C. B. Parker.—This is a very interesting subject to me, because it is the school in which I was brought up. I do not know that I can add anything to what has been said here to-night by Dr. Kimball and Dr. Lord. My present method is a combination of their methods, and if I were to say anything it would be to simply repeat what they have said.

The President.—Dr. Hawes was expected to be present this evening, and has sent a written communication which I will ask Dr. Allan to read.

Dr. Allan reads:

“20 WEST FORTY-SEVENTH STREET,
“NEW YORK, March 1, 1898.

“DEAR DR. ALLAN,—I regret very much that an engagement for this evening which I had overlooked will prevent me from being present at the meeting of the Institute. As you requested me in case I was unable to be present to write my views regarding the use of non-cohesive foil, I will simply say that for fillings on the approximal surfaces, which is the crucial test for all filling materials, it ranks in my opinion far above cohesive foil. It has, however, the disadvantage when hand-pressure is used, as so well described by Dr. Kimball at your last meeting, of causing the conscientious operator most laborious nerve- and strength-wasting labor. That continued spasmodic, nervous, mallet-like action of the arm has shortened the professional life of many a dentist, and while here and there some more vigorous than the rest have withstood it, yet it will show its effects in time. Knowing this by a personal experience, I began several years ago to look for some means less exhausting which would give as good results, and in my automatic plugger I found it. I have points similar to those shown by Dr. Kimball, but made a trifle heavier at the angle to prevent breaking. With these in my automatic plugger I can condense the soft foil laterally in all directions except that towards the hand in which I hold the instrument; much of the final condensing can be done with the same instrument, and the whole filling finished with infinitely more ease to patient and operator. All this I know would be looked upon as rank heresy by Dr. Dunning, but I feel it a duty

to myself to make my work as easy as possible, when the standard of the work is in no way lessened. If I am not mistaken the early filling of teeth with gold foil was done exclusively with non-cohesive foil, and where the cohesive quality was required, Watts's crystal gold was used. This was true of the operations performed by Dr. Elcazer Parmlee before and after Dr. Dunning was associated with him as his assistant, using the same instruments described by Dr. Kimball. My father also used the same method many years ago, and I have now instruments used by him before Dr. Dunning's time which are precisely the same as those used by Dr. Dunning later. Please bear in mind that I want to say nothing derogatory or reflecting in any way on Dr. Dunning. He was a wonderfully clever operator, and the work of his predecessors would not compare in finish and elaborateness with his, but unless the mere using of a method makes it one's own, I do not see the propriety of calling this method Dr. Dunning's.

"Yours very truly,

(Signed)

"JOHN B. HAWES."

Dr. Allan.—In reference to the burs that Dr. Kimball spoke about, I fully concur in all he said, but I would warn any one who tries them that he cannot use them with success until the inside of his thumb and forefinger have become toughened; it takes but a very short rolling of that instrument to cause quite a numb and calloused feeling, but it does pack the gold most beautifully, and to the patient it is a great comfort. Where a patient will grumble at an automatic mallet he will almost go to sleep if this bur is being used in packing the gold, but one has to practise a long time before he becomes accustomed to it and can properly use it. Dr. Hawes was at our last meeting, and, happening to ask him one or two questions in regard to the Dunning method of using soft gold, I found he had one or two points that were worthy of attention. The doctor was unable to be present to-night, but has sent the letter extracts from which I have just read.

One point only I would draw attention to. If Hawes has perfected a method of using points to pack soft gold foil as we pack cohesive gold foil and with comfort to the operator, it is a great point in advance.

The President, Dr. Bogue, called the Vice-President, Dr. C. A. Woodward, to the chair.

Dr. E. A. Bogue.—This matter of soft foil filling is one to which I also was brought up, and as there are one or two points possibly

where my work has varied a little, not in principle but in practice, from that of the gentlemen who preceded me, I will venture to say a few words.

Dr. Hawes is, I think, mistaken in writing as he does about non-cohesive foil and crystal gold. If I am not in error, pure gold is cohesive, providing it is clean. The cohesive properties of gold-foil were discovered by the act of a druggist who, wishing to send a book of gold through the post-office to a dentist, slipped the leaves out and enclosed them in an envelope; the result was that the leaves stuck together and the dentist had to cut the gold off in strips. This shows clearly that the cohesive properties of gold existed before dentists knew anything about it. After these cohesive properties became better understood, a school of practitioners arose that discarded the wedging process of packing gold, discarded the processes about which we have listened with so much pleasure and profit this evening, and began from the very bottom of the cavity with a couple of divergent holes drilled into the teeth, laboriously to build up cohesively from that to the end. It has always seemed to me that this was a mistake. I had a lady in my chair Saturday for whom I filled teeth thirty years ago; that is a good while. Nearly all my fillings were still there. The bottoms of those fillings were put in with non-cohesive foil, and where the cavities were surrounded by walls the fillings were mainly put in with cylinders, like cigars standing up in a tumbler. Wherever those cylinders had been packed, as Dr. Kimball showed us the other night, by wedging backward and sideways towards the wall of the cavity, the fillings put in thirty years ago are to-day bright and shiny. Now, all my fillings unfortunately have not been that way.

When I lived in Chicago the question came up, and we had it hotly discussed, how to put in fillings that would not pit upon the surface. The cohesiveness of gold was more or less understood at that time, but there came to us in Chicago Dr. Clark, of New Orleans, and Dr. Knapp, the father of Dr. J. Rollo Knapp, both of whom had learned cylinder filling from a gentleman in Alabama whose name I have now forgotten. Their processes were in their results identical with the processes of which we have heard this evening and at our last meeting,—namely, to cause the gold to lie in laminæ parallel with the walls of the cavity and to have the gold finished off at the end precisely as the leaves of a book might be planed off, leaving a smooth surface. Later on, after this Chicago lesson which I had taken to heart,—viz., the fact that all gold is cohesive if it is clean and pure,—recognizing that what we call

non-cohesive gold is simply gold with something on the surface, I adopted the practice of filling the bulk of my cavities, where they could not be filled with cylinders, with what was known as non-cohesive gold, and when I had reached a certain point where I wanted a smooth surface, if I was unable to adopt the principle of parallel laminae and cutting off the ends, then I used cohesive gold and drove it directly into this non-cohesive gold, with full confidence that it would stay there. Generally, by interdigitation and relying upon the cohesive qualities of the central portion of each leaf, we can be certain that we have a good anchorage. If we want a cohesive gold surface, we can safely add it to a non-cohesive filling.

Dr. F. Milton Smith.—I would like to ask Dr. Bogue in reference to the fillings whether he finished them with a cohesive foil. He said he filled the bulk of the cavities with non-cohesive foil.

Dr. Bogue.—The cylinders were so filled that they did not need the cohesive foil, but cavities needing contouring had cohesive foil on the surface.

Dr. Lord.—If cohesive gold is to be used for the surface of fillings there must certainly be a place for starting it; it must be secured mechanically, as it will not cohere to the soft gold. If the soft gold has not been packed hard and has been left so that the cohesive gold can be forced into it, that will do for an anchorage, but I much question the propriety or usefulness of cohesive gold for such a purpose.

Dr. C. S. Stockton.—We seem to be in the old barn to-night, threshing over the old straw, getting out some wheat perhaps, but it takes us back a great many years. Like my friend Dr. Bogue, I began with soft foil, but recognized, as many others do to-day, that the old Concord coach is a slow way to travel, and I prefer the trolley and cable. Things are moving in a more rapid way than they did a few years ago and we have to keep up with the times. To-day I saw a gentleman who had a tooth filled fifty-seven years ago, and the filling has remained there just as put in. It was filled, of course, with soft foil, and he has been so prejudiced in favor of gold that he will not have his own or his children's teeth filled with anything else. Some time ago one of his daughters had a wisdom-tooth to be filled, the mouth being very small, and I think that by the time she got through she was willing to have wisdom-teeth, at least, filled with other materials than gold.

Dr. Bogue has been kind enough to give us a bit of personal experience, and I hope I will be excused for following his example. Two months ago a Sister of Charity came in. I took my glass,

looked over her teeth, and very innocently said, "Sister, you have had some good work done on your teeth." I saw a kind of smile pass over her face as she said, "Doctor, you don't recognize me?" I said, "No, I do not." She then said that in September, 1872, I had put all the fillings in her teeth. Those teeth were filled with soft foil, finished with cohesive gold. Twenty-five years is a pretty fair test, and those fillings are in as good condition now as the day they were put in. Is it not wonderful that with these metal patches we are able to preserve teeth as long as we do,—twenty-five, thirty, and even fifty-seven years? Yet some patients come in and complain because a filling has come out. We have done the best that man can do, and yet they expect us to do better for them than the Lord did for them in the beginning.

Dr. Smith.—I am free to say that I have not attained to that degree of proficiency that I should like in the use of non-cohesive foil. I am trying hard and am meeting with some success. I have filled many cavities with non-cohesive foil, but in some cases when I come to finishing, not having the centre of the filling thoroughly condensed, I have used for the surface the gold as it comes in the bottles, oftentimes much softer than when we pass it through the flame, and yet quite cohesive. I have worked that into the centre of the filling, and am sure I have made successful fillings in that way.

The report of the committee upon the death of Dr. C. W. Meloney was then presented, as follows:

WHEREAS, An all-wise Providence has seen fit to remove from among us our friend and fellow-worker, Dr. Charles W. Meloney; therefore,

Resolved, That with becoming reverence we most humbly submit to the will of Him who knows the end from the beginning.

Resolved, That we recognize in our departed friend and brother one of those rare characters with whom this world has not been too bountifully supplied.

Resolved, That in his upright and manly course as a member of our profession, never seeking preferment at the expense of others, but rather standing in the background and enjoying their elevation even at cost to himself, we recognize that true manhood which is exemplified in the words of Scripture, 'Is not puffed up, seeketh not her own, is not easily provoked, thinketh no evil, rejoiceth not in iniquity, but rejoiceth in the truth.'

Resolved, That in the death of Dr. Meloney we have lost an honored friend, the Institute a faithful member, and the world that which is more rare than it should be, a faithful, conscientious dentist.

Resolved, That as a Society we extend to his companion, Mrs. Meloney, and their children our most sincere sympathy, and commend them to the gracious care of that kind Providence who careth for all His children.

Resolved, That a copy of these resolutions be sent to the family of Dr. Meloney and also spread upon the minutes of the Institute.

(Signed)

F. MILTON SMITH.

J. G. PALMER.

S. H. McNAUGHTON.

The report of the committee was unanimously adopted.

Adjourned.

S. E. DAVENPORT, D.D.S., M.D.S.,

Editor The New York Institute of Stomatology.

Editorial.

THE NEED FOR ORIGINAL INVESTIGATION.

THE fundamental basis of all knowledge is absolute truth, and absolute truth can alone be found by seeking for it, not in imaginary ideals, but upon a positive substratum of fact. The search for the absolute in the unknown has been the work of the so-called scientific thought of the ages, and will continue until the secrets of life are more and more unfolded, each development adding to the intelligence and broader conception of mankind.

To each department of work in the world is given the elucidation of its special problems, and the responsibility rests with it to continue that labor unceasingly. To dentistry has been given the upbuilding of a profession, and it is needless to add that this has been reasonably well done, but because much has been gained it does not, necessarily, follow that all problems have been solved, or that we can rest content with the labors of the past.

Dentistry had its origin in mechanics, and while it possessed many cultivated men in its ranks, both in Europe and America, prior to the middle of the present century, it failed to merit the name of a profession. All the improvements made up to that time were of a mechanical order, hence the boundary of investigation was circumscribed, but exceedingly valuable, furnishing a foundation for future work of an important character. It was not until the formation of the first dental college by Chapin A. Harris in 1840 that the profession of dentistry can date its rise. From this period the work assumed a broader character and a more extended responsibility. It meant a call to the dental world to unification

of effort, and, if it had no other signification, this was of vital importance. The effect upon the dental mind was not immediate, in fact for thirty years it was a question with many whether it would be possible to overcome the inertia of the mass, imbued, as it was, with the trade instinct rather than the scientific spirit.

It is due largely to the work of a persistent body of earnest men in Europe and this country that at last a true professional feeling was aroused, and with this came an increase of dental educational institutions everywhere, followed by restrictions of law, until the crudities of the past have been, if not entirely obliterated, at least forced to assume a subordinate part.

While all this is true and universally recognized, it is not equally appreciated that to continue this something more is needed than a mere passive acceptance of past work, as though all had been accomplished necessary for the well-being of our calling. It is feared that this spirit of inactivity has begun its deadly work in undermining the life of dentistry. While it is true that a few men are earnestly laboring in scientific explorations, these are in such a small minority that they are almost lost in the mass, and, it is feared, their work fails in the impress it deserves.

If this be not true, what means the rush for journals that condense in a few lines the work, it may be, of months, if it be not to cater to that indolence and vacuity of mind that refuses to give even the time required to read and study thoroughly the work of others? It means, if it means anything, that the dental profession has not time or disposition to think, much less to read or to act. There is nothing so discouraging to the true teacher than to find the student receiving listlessly the scientific side of his work, but will, as Dr. Peirce remarked in the last number of this journal, greedily ingather all that will aid him in his future financial operations. Dentistry will never be a true profession until the members thereof give to the accumulation of money the second place in their ambition. The cry is constantly heard, "We have no use for journals with labored scientific articles. Give us something that we can apply to every-day practice." The answer to this must be that the so-called scientific articles are the cream of thought and experience, and to miss which means the feeding upon the residuum, which, while it has a value, may be regarded as the pabulum for babes and not the food suitable for a vigorous and growing profession.

If there is one need more imperative than another in dentistry it is an effort to rouse the sluggish mentality to work, or at least to

a more thorough conception of the necessity for that which does not pay in a financial sense. Until something better is presented than in much of our periodical literature, the outlook must assume pessimistic proportions. The journals of a profession rise to the dead level of those who read them, and can go no higher. Unfortunately, the journals of this country, with two or three exceptions, receive their impulse from trade, and whenever a profession levels down to that it cannot rise to a recognized scientific basis.

It is unfortunately true that our professional work is most exhausting, and individuals degenerate in it from sheer lack of moral courage to do more than the day's work requires, but some meet this difficulty, and others should follow if we are to maintain the respect of the thinking world.

It is a pleasure to recognize the fact that many of the younger men are imbued with the altruistic spirit of research, and while gratefully acknowledging this, it is hoped that more will repay that which they have received during their student years, for the dictum of Bacon, that "I hold every man a debtor to his profession," is as forceful to-day as when he wrote. Original investigation is the crying need of the present era. It is more than ever desirable to know what things are rather than what they ought to be in the imaginations of writers. Our literature is loaded down with pages upon subjects in which barrenness of original thought is but poorly compensated for by prolixity of words. It is a truism to say, every one has the germ of originality, and it is equally true that it simply requires an effort to bring it forth. The baleful dependence upon authority must be overcome if this original thought can see the light. "Take truth for authority and not authority for truth," is such a valuable precept that it should be engraven upon every mind. Seek the fountains for the source, and not the flowing rivers or the boundless oceans. It may be said, with some degree of truth, that this individualized seeking for light will come in time, but while this may be the ultimate result, it can never take place unless a broader example is set than exists at present. The cry is not now for more books, more periodicals, but for more readers, for more workers, and when this demand is filled then will dentistry be truly worthy of the name profession, which it is feared it does not deserve at present. We must grow out of the crudities of the past and rise worthy the age in which we are workers, for no one is justified in resting contentedly with the step gained, for another always lies before us for something higher.

THE NATIONAL DENTAL ASSOCIATION, DIVISION OF THE EAST.

UPON another page our readers will find a call for a meeting at Albany, N. Y., to organize a branch of the National Dental Association for the Eastern States.

In our opinion this movement is not only premature, but it has not been called through the proper channels. No power exists in the organic law adopted at Old Point Comfort which gives to the officers of the national body the duty of organizing a branch, and this call is signed by the President and one of the Vice-Presidents of that organization. When the National Association has passed the ordeal of the first regular meeting it would then be appropriate to issue a call in proper order, but not until then.

The correct course would have been to send out a circular asking the co-operation of all subordinate associations requesting them to send delegates to an appointed place to confer as to the best means to take in organizing the proposed branch.

The course pursued has been the direct opposite of this. On the face of the call it appears to have had its origin in a self-constituted body, but as a matter of fact it was conceived in a single organization, and went no further, so far as society co-operation was concerned. The East has a large number of active organizations in which are to be found many of the most earnest workers in the dental profession, and this should have prevented arbitrary action without due consultation. The way the matter stands at present the ardor of many will be cooled and the work will be placed under the ban of suspicion, a most unfortunate result.

The dental profession is wearied with the methods of the past, and if we are to have simply a repetition of individual control, then it will be the duty of those having the best interests of the profession at heart to seek other avenues for the work of the future.

THE RECENTLY ENACTED LAW OF NEW JERSEY.

LAW in its relations to dentistry has been quite fully discussed upon the pages of this journal and elsewhere, but the subject is of such vital importance to the educational interests of dentistry that it cannot be set aside, for it is constantly recurring in new and

startling phases, requiring constant watchfulness on the part of those whose duty it is to act as sentinels upon the outposts.

It has been assumed by the advocates of dental law that these efforts were made solely in the best interest of dental colleges and for the advance of dentistry, and many have been willing to accept this at the valuation placed upon it by the examining boards, State and national. Those more directly interested in educational work have been slow to recognize this doubtful interpretation, and have felt that the actuating impulse with many has been a desire to cripple the work of colleges, if not directly to antagonize their efforts. Whether this feeling has been justly founded or not is not material at the present writing, but the fact is quite prominent that if the boards are anxious to raise the dental profession to a higher standard, some of them, at least, have very peculiar methods in its manifestation.

The attention of the profession is called to the following clause in the recently enacted law of New Jersey, which reads as follows:

"No person shall be examined by the said Board unless he be twenty-one years of age, of good moral character, and having received a preliminary education *equal to that furnished by the common schools of the State* and be graduated in course with a dental degree from a dental school, college, or department of a university *recognized by said Board*, or, *unless he shall present the written recommendation of at least five licensed dentists of this State, of five years' standing, that he is qualified for such examination*, or shall hold a diploma or license conferring full right to practise dentistry in some foreign country and granted by some authority recognized by the Board." (*Italics ours.*)

When the National Association of Dental Faculties in 1884, immediately after the organization of that body, passed a law making it impossible for colleges under its jurisdiction to graduate a student upon what was termed "five years' previous practice," it was regarded everywhere as a marked advance. The rule of the colleges prior to this had become a scandal in the profession, and this action of the faculties was held to be in accordance with the wishes of the best elements in dentistry. The man whose entire experience may have been confined to five years in the dental laboratory, without the possibility of attaining any theoretical knowledge, was permitted under the five years' rule to matriculate, and after four months in the schools was sent out in the world as a Doctor of Dental Surgery. It was through a union of all the colleges that this stain upon American teaching was blotted out, it was hoped,

forever. Gradually the standard of all the schools was raised, through the persistent efforts of the "faculties," to a course of three years, and it was then felt that the educational interests were placed upon a sure foundation.

The demand of the boards has been and still continues for a still higher standard, and some have gone so far that they have been obliged to retrace their steps.

The most persistent State in the Union to demand, through its Board, a higher standard has been New Jersey; indeed, this Board has recently declared it would not recognize any college that failed to come up to a standard far higher than that adopted by the National Association of Dental Faculties at its last meeting. In the face of this assertion, this same State has recently passed the law from which quotation has been made, which permits the Board to examine men upon the "recommendation of at least five licensed dentists," without a day of college training to their credit, and should they pass, are given the right to practise in the State of New Jersey. It may be said, by way of exculpation, that this is the law, and that the Board cannot do otherwise. Who made this law? The answer must be, the dentists of New Jersey. It is impossible for the governing dental power to shirk responsibility in this matter, even if so disposed, which is questionable.

It is deeply to be regretted that the dentists of New Jersey have had this scandalous piece of work thrust upon them, for we are willing to believe that all are not responsible. As it stands at present, New Jersey has put back dental education in that State to where it was prior to the organization of the National Association of Dental Faculties, and has undone within its borders the work of fourteen years.

If dentists needed an objective lesson upon the baleful effect of giving power to a few men, it has it in this clause of the law as quoted.

It is due to the dentists of the United States and the educational institutions that this obnoxious law be repealed as speedily as possible, and we have no doubt but that the best thinking men of New Jersey will take measures to effect this, for we are confident that there is a large body there who will not rest until this is accomplished.

STANDARD OF ENTRANCE RAISED.

THERE has been an effort for some time to raise the standard of entrance in dental colleges throughout the United States, and it is generally conceded that this will be required of all in the near future, but it is at the same time recognized that the colleges, as a whole, are not prepared to accede to the demands of some of the more favorably situated institutions.

The faculty of the Department of Dentistry of the University of Pennsylvania has recently adopted the following as its standard for the future :

"Candidates for admission will be required to present evidence of preliminary education as follows: For the session of 1898-99, a certificate of High School entrance; for the session of 1899-1900, a certificate of two years' High School attendance; for the session of 1900-1, a diploma of an approved High School having a three years' course, or a certificate showing three years' attendance at a High School having a four years' course, or certificates from other schools showing equivalent education. In lieu of such diplomas or certificates the applicant will be required to pass a matriculate examination which shall in each case be the equivalent of that forming the basis of the certificates of required preliminary education."

This places the Department of Dentistry on an equality with that of medicine in the same university in entrance requirements.

Time alone can determine the result of this high standard. While it undoubtedly will have a good effect in one direction, it may, on the other hand, if generally adopted, seriously interfere with the manipulative ability that has been a marked characteristic in the past of American dentistry.

Domestic Correspondence.

WHAT IS DENTISTRY ?

WASHINGTON, D. C., March 25, 1898.

TO THE EDITOR :

SIR,—A trial of some possible importance has been in progress in the Police Court of the city of Washington involving the above question. The patentee of certain attachments for retaining partial and full dentures in the mouth, which it is claimed is an improve-

ment on previous methods, was on trial for "practising dentistry without a license" from the Board of Examiners of the District of Columbia. It developed in the course of the trial that defendant was not a dental graduate. The custom—possibly it is the law—in the District of Columbia is to allow graduates of "reputable" colleges to practise without examination by the board. Persons who are not graduates are required to pass such examination as the board may prescribe. This examination successfully passed, the applicant is furnished with a certificate which gives him license to practise. Without such license he is liable to prosecution for misdemeanor.

Defendant was introduced, or rather introduced himself, to a number of the dental profession of Washington about a year ago, and exhibited his patented appliances in private offices and at public clinics given in the offices of dentists, making such operations in the mouth as were necessary and preliminary to the insertion of the denture. Teeth were implanted, crowns amputated, canals opened and filled, holes drilled in teeth for the insertion of pins, and possibly in some cases fillings inserted for the firm attachment of the fixtures. Quite a number of the profession, taking an interest in the method as shown, had him insert pieces for their patients, he furnishing such materials and fixtures as were needed in his special method. Fees were doubtless taken, but this feature of the case is unimportant. The thing which especially interests the dental profession was the trial which resulted as growing out of the arrest of defendant for practising without a license, as above stated. A large number of dentists of the city were summoned as witnesses, some by the prosecution, some by the defence. Great interest was manifested, for it was felt by not a few that the fate of the law somewhat depended on the outcome. If defendant were acquitted, it was felt that the law was a practical failure, for it was evident that he was not licensed, and also that he had not applied to the Board for such license. Moreover, as stated above, he was not a graduate.

He was, however, a matriculant of a dental college of the District of Columbia, and a good deal of legal fencing was done by counsel to show that what defendant did in a dental way was done as a student of the college, and was thus by the law allowable. The prosecution contended that the work of a student would not be of this character, and drew out of the witnesses for the defence the unwilling admission that the defendant was teaching them (the dentists in whose office he was), not they teaching him; the teaching in question being instruction in the methods used and patented by him.

The principal interest in the case, however, to the profession at large, and that which alone makes this report worth making, is in the "expert" evidence brought out by the defence as to *what constitutes dentistry*.

Possibly no trial, certainly no trial with which the writer is familiar, shows more widely divergent views as to this subject. The border-line between dental surgery and prosthetic dentistry was made the subject of an infinite amount of discussion and hair-splitting wrangling between opposing counsel. Witnesses themselves seemed to have the most opposite and irreconcilable views on the subject. Some seemed positive in the conviction that the two subjects had nothing in common, and that the maker of a "set of teeth," no matter how great his skill, or how difficult the work, was not practising dentistry. Others seemed quite as positive that, in the ordinary acceptation of the word, "dentistry," derived from *dens*, a tooth, meant any work done on a tooth or about it. As an illustration of the one view, one dentist gave as his opinion that the extraction of a tooth, the amputation of the crown, the attachment of a porcelain crown to this root, and the subsequent replacement of the root in the socket from which it had recently been removed was *not* dentistry. It seemed doubtful even to some as to whether the removal of calculus from teeth preparatory to treatment and crowning was dentistry.

The aim of the defence was to prove that what defendant did was not dentistry, the prosecution trying to controvert this. Really the weight of evidence, at least so far as numbers went, seemed rather to show to the jury that what defendant had been doing was not dentistry, although it was proved incidentally that he had filled teeth as well as crowned. A great effort was made to show that crowning, bridge-work, plate-work, etc., was not dentistry.

A leading question, often recurring with the counsel, and about which many questions were asked, was, "What is oral surgery?" In the minds of the greater part of the witnesses there seemed to be a sharp distinction made between oral surgery and dentistry. One witness was understood to say that the only oral surgeon proper in the country was the late Professor Garretson. Nearly all seemed to think that oral surgery was something distinct and but little allied to dentistry. A few thought that any operation in the mouth was oral surgery, whether the extraction of a tooth or the filling of the same, the crowning of a root or the resection of a jaw.

It seems clear, from all the evidence given in this trial, that either the "expert" testimony in this case was not particularly profound,

or else that definitions in dentistry need punctuation. What is oral surgery? What is operative dentistry? These certainly are not questions for courts to decide except on expert testimony, and where experts disagree so widely as to what is what, any decision of a court must necessarily be worthless.

One question is of interest. It was clearly shown on the trial that the defendant was skilful. It was shown further that he had invented what was by many believed to be invaluable improvements in dentistry. It was not, I suppose, within the province of the court to decide as to this matter, but the question may come up at any time, and be fought through the courts, What is a man's "vocation"? The constitution protects a man in "the pursuit of his vocation." If dentistry is one's vocation, can any local law interfere with its pursuit? Is not such law unconstitutional? Then may arise that other question to vex the profession and the courts as well, Who is to decide the matter of fitness for a vocation? To illustrate: a college grants a student a diploma. This should be *prima facie* evidence of fitness. The diploma *should*, it would seem, establish the vocation. Has, then, a State board the right or a State legislature the right to pass any law which will interfere with the "vocation" of the holder of the diploma? On the other hand, must the graduate, in addition to what his diploma may say about his fitness for practice, have that fitness further tested by a "board?" These are grave questions, not raised in a spirit of captiousness, but may and probably will arise some day to vex both college faculties and examining boards as well.

One point of interest should be mentioned in connection with the evidence of the "experts." The law is venerable, and precedent counts for almost everything in a court. Because some of the witnesses were men of great age, the judge and jury were urged by counsel to look on such testimony as being peculiarly valuable. As a matter of fact, it may or may not be. It depends. The lines shift so rapidly in dentistry, the work of to-day is so totally different from that of a decade ago, and both progress and variety are so great, as to make it difficult for the keenest-witted and most vigorous-brained young man of the profession to keep the pace. All who know the conservatism of age know that whatever may be the accuracy of judgment of such, the keen, sharp apprehensiveness is dulled by years. This is written in no attempt to derogate from the veneration of age, but as stating a fact that all old men of candor allow.

In conclusion, should this court decide that the operation of

attaching a porcelain crown to a natural root,—such a decision is quite possible,—or decide that defendant did not practise dentistry, because he only prepared roots for the attachment of his “patented methods,” or that his patents gave him the right to practise, on the principle that the greater must override the lesser, or should a legal distinction be made between oral surgery and operative dentistry (courts have made far more wonderful decisions than such), what effect will all this have on the legal status of dentistry? What effect on the legal status of “Examining Boards”?

Certainly dentistry should have a jurisprudence, but if courts are to decide these things for us, it behooves the profession to look into the matter, that we may not be bound by some decision of a “police court,” to be quoted by future courts and lawyers as good law and “expert testimony.”

Appended is the decision of the court. The charging of the judge seems clearly to show that in his opinion what defendant did was dentistry, but the jury came to the conclusion that he was not guilty of a violation of the law. How they arrived at such a conclusion is, I dare say, one of the mysteries of the jury system.

JAMES B. HODGKIN.

“The United States branch of the Police Court met this morning at nine o'clock, Judge Scott presiding.

“Judge Scott announced that he had granted prayers offered by Prosecutor Baker, as follows:

“1. If the jury believe that the defendant has practised or attempted to practise dentistry in the District of Columbia during the period covered by the information or at any time within three years from the filing thereof, and if they further find from the evidence that the defendant has not registered with the health officer, in compliance with the act of June 6, 1892, then they shall declare the defendant guilty, unless they find that the defendant is under *bona fide* pupilage with a registered dentist,—meaning that in good faith the defendant is a pupil or scholar of a registered dentist, or that he is pursuing a regular uninterrupted dental college course and in the course of his studies and practical work in said college.

“2. The jury are further instructed that it is no defence to the charge contained in the information that the defendant is a student of a dental college in this District, unless they find further that the acts alleged to have been committed by him were committed while he was pursuing a regular uninterrupted dental college course, and in the course of his studies in said college as a part of the course thereof.

“3. The jury are instructed, as matter of law, that if they believe from the evidence that the placing in the mouth of a denture, or of an anchor-denture, comes within the science of dentistry, then it is no defence to the charge mentioned in the information that the defendant has or claims to have certain patent rights covering a denture.

"4. The jury are instructed, as matter of law, that if they find from the evidence that the defendant did practise dentistry in the District of Columbia, it is no defence to the charge that he is patentee of certain appliances that are used or placed in the mouth for the purpose of anchoring teeth, and they are further instructed that such patent does not give the defendant a right to practise in the District of Columbia.

"5. If the jury believe from the evidence that the defendant practised or attempted to practise dentistry in the District of Columbia without having complied with the previous law of dentistry in said District, then the jury are instructed, as matter of law, that it is no defence to the charge against him that he is the owner and patentee of certain letters patent.

"6. The jury are further instructed that it is no defence to the charge in this information that the defendant is under *bona fide* pupilage with a registered dentist, unless they further find that the acts committed, if they find any acts committed by the defendant, were performed by him in the office wherein he claims to be a pupil, and as a pupil therein.

"7. If the jury find from the evidence that the defendant merely styles himself a pupil of a registered dentist, and that no *bona fide* pupilage exists, but that he really was the teacher, and if they further find that the defendant has practised or attempted to practise dentistry in the District of Columbia without complying with the act of June 8, 1892, then they shall find the defendant guilty."

"Three prayers offered by the government were rejected by the court.

"The argument of counsel followed.

"Mr. Jeffords noted an exception to all the prayers offered by Mr. Baker and granted by the court, and gave notice of an intention to apply for a writ of error.

"Judge Scott read to the jury the law in reference to the practice of dentistry in the District of Columbia. He also referred briefly to the evidence, at the conclusion of which the case was given to the jury, who at once retired.

"The jury at 2.22 o'clock this afternoon rendered a verdict of not guilty. The defendant was then discharged."

ELECTION OF DELEGATES TO NATIONAL ASSOCIATION.

TO THE EDITOR:

SIR,—Will you please call attention to that section of the by-laws of the National Dental Association which relates to the appointment and qualifications of delegates, which is as follows:

"Article III., Section 8.—All delegate members shall be practitioners of dentistry. They shall be received only from permanently organized State dental societies. They shall be elected by ballot at some regular meeting of their society, and shall be members who have done meritorious work for the profession; but no person shall be received as a delegate who is in arrears for dues to this Association."

Also,

"Article IV., Section 1.—Each State society may send one for every ten of its active members, as delegates to this Association for one year, upon complying with the requirements of its constitution; but no society shall be entitled to representation that does not adopt or substantially recognize the Code of Ethics of this Association."

The fact that the *American Dental Association* received delegates from both local and State societies renders it necessary to call attention to the fact that delegates to the *National Dental Association* will be accepted only from the *State* societies, and that such delegates must be elected by ballot at a regular meeting of the society.

By request of the President.

EMMA EAMES CHASE,

Corresponding Secretary National Dental Association.

April 4, 1898.

[Will some one explain the meaning of Section 7, Article XIV., "Each branch may receive delegates from societies within its division, . . . and such delegates shall have the same standing in the *National Association as though admitted directly from the State societies.*" (Italics ours.)—ED.]

BURNING BY RÖNTGEN RAYS.

TO THE EDITOR:

SIR,—In the March number, on page 198, a case of burning is mentioned which is attributed to Röntgen rays. Now, if there is any fact well established about Röntgen light it is that it cannot burn. It is almost two years since Mr. Tesla stated that the burning was due to the electric discharge, and that if a screen of aluminum was placed between the tube and the patient and well-grounded no burning could take place. In the *Electrical Review* last year I showed by experiment that severe burns could be produced from a tube which gave no Röntgen light, the vacuum being so high that the current could not pass between the terminals, and no screen being placed between my hand and the tube. The matter has therefore been experimentally proved from both sides, and any person who burns a patient is guilty of malpractice and should be sued.

Yours respectfully,

WILLIAM ROLLINS.

Obituary.

DR. ALBERT NELSON CHAPMAN.

THE death of Dr. Albert Nelson Chapman occurred in Brooklyn, N. Y., on Wednesday, March 23, 1898. Although he had been ill for nearly three weeks with a severe attack of grip complicated with nerve trouble, no apprehension was felt of any fatal ending of his illness. He was considered convalescent, and on the day he died took a few steps around his room about 11.30 o'clock in the forenoon. Remonstrated with by his nurse for exposing himself, he consented to return to bed, remarking, "Yes, I want to rest," the last words which he ever spoke. In less than an hour, apparently asleep and lying quietly upon his side, he died from the bursting of a small blood-vessel in the brain.

Dr. Chapman was born in West Hampton, Mass., on March 27, 1838. He entered upon his professional work in Brooklyn in 1865, and for thirty-three years occupied the same suite of apartments in the Athenæum Building, corner of Clinton Street and Atlantic Avenue. He had strong artistic tastes, and his rooms were filled with choice pictures and works of art.

Professionally it was conceded that no one stood higher, his work being a synonyme for excellence. His practice was always extensive, and among the best families in the city. His patients, too, became, as a rule, his lifelong friends. His professional pride and conscientiousness was excessive.

During 1874-75 Dr. Chapman was President of the Second District Dental Association, and in 1877 was elected Librarian of the same organization.

Dr. Chapman's geniality of disposition and manner, his tender nature, and cheery helpful spirit greatly endeared him to every one who made his acquaintance. With a great wealth of floral offerings sent to his office from every direction, his remains were taken to his old home in West Hampton for interment on Saturday, March 26. On the day following he would have been sixty years of age. He leaves both in Massachusetts and in New York hosts of friends to remember him with the greatest tenderness, and to mourn him with sincerest sorrow.

C. B. L. R.

Notes and Comments.¹

NEURECTOMY FOR TIC DOULOUREUX.—In a paper before the Mississippi Valley Medical Society, Professor Bernays reports the following case where neurectomy was performed for the relief of a severe case of tic douloureux, and refers to the value of antikamnia as an obtundent. He says, in part, "The patient has one sister who suffered from emotional insanity; otherwise the family history is good. Previous health excellent. The present trouble began with a severe neuralgic toothache, localized in the right lower molars. Paroxysms of pain were of daily occurrence, and most severe in the mornings about breakfast time. The pain subsided temporarily whenever the teeth were pressed firmly together or upon any substance held between them, but only to return when the pressure was withdrawn. The presence of anything cold in the mouth immediately produced the most exquisite pain; moderate heat produced a soothing effect. After two months the pain became continuous, and five teeth were extracted at different times without in any way relieving the trouble. On the contrary, the pain increased in severity until October, when it ceased entirely for a period of two weeks. A recurrence then took place, together with an involvement of the parts supplied by the second branch of the fifth nerve. She had strenuously avoided the use of narcotics, but during the more active periods of pain, antikamnia in ten-grain doses was found to be an efficacious obtunder." After describing the neurectomy, Professor Bernays says, "Eight weeks have now elapsed since the operation, and no recurrence of the trouble has taken place."

COCAINIZING PULPS FOR REMOVAL.—The removal of dental pulps, which is never an undreaded operation by the patient, and not always an easy one for the operator, can often be accomplished very satisfactorily to both. Dr. J. Y. Crawford, of Nashville, says, "Of all the operations in minor surgery demanding local anæsthesia, the removal of a live pulp most demands it. Having

¹ The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 1338 Walnut Street, Philadelphia.

decided through diagnosis by exclusion that it is clearly a case of pulpitis and that the pulp must be removed, put on the rubber dam, dry the cavity, wipe it out with bichloride of mercury 1 to 3000, dry again, and repeat several times. When satisfied that it is sterilized, peel away the dentine carefully until you get a tiny exposure, then take a little muriate of cocaine, ten-per-cent. solution, on a tiny wad of cotton, and lay it over the point of exposure. With your fingers form of wax a lid for the cavity of the tooth, fit it over and convert the tooth into a force-pump, forcing in the cocaine. Then trim away more dentine, enlarge the exposure, and work your pump again, forcing in more cocaine; you will find that you can remove the pulp painlessly and pull it clear out of the lingual canal, which will offer no resistance. Now, before going any further, cork up the canal to prevent any *débris* entering. Now work in more cocaine, and with a broach remove the pulp from the next canal and fill that up, and so on. That tooth is worth all the pains you can take with it, and you want to keep the canals in an aseptic condition, preventing the entrance of any *débris* from the dentine you will remove in preparing the cavity for filling. That pumping process will enable you to anæsthetize the pulp so that you can remove it without pain to the patient, and you will not want any more arsenic. In case of hemorrhage, the application of the bichloride of mercury solution will arrest it at once."—*American Dental Weekly*.

A GOOD SUGGESTION.—We are of the opinion that the more the dentist knows of surgery and medicine the higher will be his appreciation of the surgeon and physician, and the more careful and the more able will he be to conduct his dental practice on the lines of his specialty, and avoid the pitfalls of a "little knowledge."—*Journal of the British Dental Association*.

EMBARRASSING EFFECTS OF COCAINE.—The *Dominion Dental Journal* reports a case where a patient after having a tooth extracted was arrested on account of the influence of the cocaine used as a local anæsthetic. When called upon to extract the tooth the dentist injected a few drops of cocaine into the gums. The operation went on successfully, but hardly had the patient left the office of the practitioner when a nervous excitation seized upon him, and without any reason led him to the palace of the governor, with the

intention, as he shouted out, "to die in his arms." With great difficulty he was taken to the police head-quarters and kept for a few hours until his mind was in a normal state, when he was dismissed after having given an explanation.

IS THE USE OF TOBACCO INJURIOUS TO THE TEETH?—In an article on "Nicotiana" in the *Dominion Dental Journal*, Dr. A. C. Cogswell says, "The premature loss of teeth to those who use tobacco in any form, and more especially to excess, by many can be proved beyond a shadow of doubt. To those of the profession who are called to operate on the mouths and teeth of such persons, it is needless to say it is often found that the odor from such mouths is steeped with the last fumes of the pipe, the teeth blacker than the ace of spades, especially on the lingual surface, covered with nicotine, and gums spongy and receding from the necks of the teeth, usually attacking first the upper molars, causing exposure of the palatal roots, loosening of the same, and attended frequently with general elongation, pyorrhœa, and premature loss." While the writer does not use tobacco in any form, he has examined the mouths of many who were addicted to it, and has yet to see these deleterious effects. In fact, the conditions have always been quite the opposite.

Current News.

MASSACHUSETTS DENTAL SOCIETY.

THE next Annual Meeting of the Massachusetts Dental Society will be held at Mechanics Building, Huntington Avenue, Boston, Wednesday and Thursday, on the 1st and 2d of June next, and promises to be one of the most successful in the history of the association.

The committee having the matter in charge hope to secure one of the largest exhibits of dental depot supplies, dental laboratory work, chemicals, and other goods necessary or applicable to the practice of dentistry which has never been shown in New England.

To this end they have secured a large, well-lighted room for the accommodation of exhibitors, and have formulated such rules and

regulations to govern the distribution of space and the admission of exhibits as will insure just and fair treatment of all, whether the amount of space they require shall be great or otherwise.

The cost of space will be seventy-five cents per running foot (not less than eight feet will be sold to any one exhibitor), and the width of the exhibit shall not be greater than six feet.

Payment for space must be made in full by the 20th of May next. (Checks, etc., to be made payable to the Chairman of the Committee on Halls and Exhibits.) A small extra charge will be made for electricity to those exhibiting engines, lathes, furnaces, etc.

Choice of space will be sold at auction to the highest bidder. The committee fail to see how there can be much choice of space in the rooms they have taken, but have introduced this provision as a safeguard both to themselves and to the exhibitors.

Exhibitors will not be permitted to have any nostrums on their tables, neither will they be allowed to make this a bargain sale of bankrupt stock, but are expected to come to us with their regular lines of goods, of which they can sell as much as they please as cheaply as they like.

The committee reserve the right to reject or eject any applicant for space, or occupant of the same, whenever it shall appear to them to be in the interest of the Society so to do.

The committee will have full charge and control of the exhibits.

Hoping to have the pleasure of marking off a large block of space for your house,

We remain, respectfully,

F. S. BELYEA, *Chairman*,

W. E. BOARDMAN,

J. W. BAILEY,

Committee on Halls and Exhibits.

BROOKLINE, MASS., April 1, 1898.

NATIONAL DENTAL ASSOCIATION, DIVISION OF THE EAST.

At the request of William Jarvie, V. H. Jackson, W. W. Walker, of New York; S. G. Watkins, B. F. Luckey, of New Jersey; E. T. Darby, D. N. McQuillan, of Pennsylvania; L. D. Shepard, of Massachusetts; H. A. Smith, of Ohio; and G. E. Hunt, of

Indiana, a meeting of the members of the National Dental Association residing in the East is called at Odd Fellows' Temple, Albany, N. Y., on Thursday, May 12, 1898, at two o'clock, to organize a branch of the National Dental Association, and to transact any other business which may properly come before them.

As this meeting is coincident with that of the New York State Dental Society, any member obtaining a certificate when he purchases his railroad ticket will be entitled to reduced return fare.

Reduced rates at Kenmore Hotel.

THOMAS FILLEBROWN,

President National Dental Association.

JAMES MACMANUS,

Vice-President National Dental Association for the East.

HARVARD ODONTOLOGICAL SOCIETY.

THE following are the officers elected for the Harvard Odontological Society for 1898:

President, Arthur H. Stoddard, D.M.D., 196 Marlboro Street, Boston; Recording Secretary, Joseph T. Paul, D.M.D., 3 Park Street, Boston; Corresponding Secretary, Edward B. Hitchcock, M.D., D.M.D., Newton, Mass.; Treasurer, Lyman F. Bigelow, D.M.D., 196 Marlboro Street, Boston; Editor, Henry L. Upham, D.M.D., 128 Charles Street, Boston.

Executive Committee.—Joseph T. Paul, D.M.D., Frank T. Taylor, D.M.D., William P. Cooke, D.M.D.

The Twentieth Annual Meeting is to occur February 26, with a banquet, admitting ladies, at Young's Hotel.

E. B. HITCHCOCK,

Corresponding Secretary.

THE International Dental Journal.

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No. 6.

Original Communications.¹

THE DAWN OF MODERN DENTAL LITERATURE.²

BY WILLIAM H. TRUMAN, D.D.S., PHILADELPHIA.

ANCIENT, old, modern, and recent are convenient relative terms having, however, no absolutely fixed values. I propose to embrace by the expression Modern Dental Literature that which is in direct touch with the present; so closely in touch, indeed, that we may from the present trace backward, step by step, until a point is reached when the well-marked path abruptly ends. Beyond this sharply defined point, while we know that much concerning the teeth had been written, it is for the most part so included with other matters, so scattered and indefinite, and withal so shrouded in uncertainty, and so inaccessible, that it is difficult to trace it, and much more difficult to estimate its true value. Prior to the time when the art of printing came into general use the methods in vogue for preserving and diffusing the world's accumulated knowledge was so laborious and expensive that only matters of great moment were recorded, matters of lesser import were transmitted and preserved by word of mouth, and necessarily, on this

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before the C. N. Peirce Dental Society of the Pennsylvania College of Dental Surgery.

account, real progress was slow because much that was learned was forgotten. Each new generation, instead of beginning, as is now the case, its life-work where the last ended, was compelled to follow very closely the footprints of its immediate predecessors; learning by experience much of that which we now more quickly learn from the printed page, on which each generation erases the errors of the past and adds new facts for the information of its successors.

The advent of the printing-press marks an important epoch in the world's history, a momentous one in the history of its arts and its sciences. This invention, indeed, so completely revolutionized all that concerns the moral and intellectual welfare of the race, and all that makes man to differ from the brute, that we may rightly consider it the dividing line, and call all that preceded it ancient; all that followed it modern.

At this time it is very difficult to realize how the world then was, how its business was conducted, and especially the condition of its arts and its sciences, the growth and maintenance of which depends so much upon a constant interchange of thought and experience, when the only way in which this could be accomplished, other than by word of mouth, was by the slow, tedious, laborious, and expensive process of making each record, and each duplicate copy thereof, by the pen or its equivalent. Naturally, as the result, progress was slow and uncertain. The friction of mind upon mind, the constant and steady increment of knowledge, the gathering together, the comparison, the sifting of ideas and of widely separated and varied experiences, which in later times has done so much to advance the world's intelligence, was almost wholly unknown. The meager records of each succeeding dominant nationality, when its dynasty lost power and its empire crumbled, were buried beneath its ruined cities, and thus lost to their successors. Each new civilization began anew, profiting but little from its predecessors, and in turn leaving but little accessible to those which followed. Thus, civilization followed civilization in an unvaried circle, each leaving the world but little better than it found it.

Notwithstanding this, as time passed, these forward and backward movements resulted in a slow, but nevertheless a real and well-marked advance. Instruction was largely through the living teacher, and was mainly a recital of his own experience, or an exposition of the dogmas of his acknowledged master. Now and again, fostered by an enlightened monarch, brought about by commercial conditions, or under the influence of a master mind or a

more than usual attractive teacher, educational centres were formed, where libraries were collected, and where, under favorable auspices, students and teachers were brought together; and here the lines were broadened, and for the time being science made a healthy and vigorous growth. For the most part, however, so far as medical science and the sciences correlated to it were concerned, dogmatic assertion and a slavish deference to authorities perpetuated error and discouraged original investigation.

As we approach the renaissance—the dawn of the nineteenth century civilization—we notice a wonderful change. The individuality of the man begins to assert itself as never before. Political and religious bonds are becoming irksome; and as the long dark night is drawing to a close, the various influences which have so long hampered intellectual progress give way before the advancing light. The political atmosphere becomes clearer, discordant elements harmonize, the world is getting together for a forward leap. The disciples of Hippocrates, Galen, and of other masters a thousand years dead are beginning to ask whether these teachers, so long implicitly followed, knew all there was to be learned. They began to ask this question of nature, to compare the accepted dogmas of the past with the experiences of the present; they began to inquire, the one of the other, Are these teachings we have so long followed really true? The freer intercourse between nations as commerce began to develop, the greater facilities for the interchange of thoughts and ideas brought about by the adoption of a universal language for science, and the ready duplication of records afforded by the printing-press soon brought about such an upheaval and revolution as this world of ours had never before known.

Of the extent and character of the dental literature of ancient times but little is now known. It is said of many medical writers of antiquity that they wrote upon the teeth. It is not probable, however, that any of these books have been preserved in their entirety; indeed, very little of their writings of any kind or character have survived, and this little has necessarily passed through so many revisions and expositions that it is difficult, if not impossible, to give an intelligent idea of what they originally were. Of many of their books not a trace can be found; all we know is the title or, perhaps, a few thoughts or suggestions preserved through quotations of later writers. Even of the great teachers, all that has come down to us are the more prominent of their discoveries, or the aphorisms, or distinctive doctrines taught as theirs by their professed disciples. Traces of a dental literature may be found in

these, and here and there an intimation that the teeth and their diseases had occupied their thoughts. Now and again an historic incident, a joke or pun of some ancient jester, or an antique tomb, gives evidence that our art existed and was practised in remote times; to what extent, the character of the work and all details concerning it have been so far completely lost. We may hope that this chapter of dental history will be brought to light as the records of long-forgotten civilizations are discovered and deciphered.

We have in this little book I now show you, the oldest printed book known to dental bibliography, dated 1532, evidences of this pre-existent dental literature of which I have spoken. It is in German; translated, the title-page reads, "Teeth Medicine; against all kinds of defects and diseases of the teeth; many wholesome and well-tried medicines extracted out of the books of Galen, Avicenna, Mesue, Cornelius Celsus, Pliny, and others; together with compendious and useful instructions as to how one can keep his teeth healthy, and how one can extract the bad hollow teeth which get to paining easily."

This copy was printed by Peter Jordan, at Meyng. I have seen another copy, dated 1541, printed by Christopher Egenolff, Frankfurt; and I find record of another publication under date of 1614, slightly differing in title, but undoubtedly the same. We thus see that it was kept before the public some eighty years at least. For a few minutes let us examine this curious and quaintly worded little book; let us see who these worthies were to whom it refers, and what they are credited with saying. First, however, permit me to say that it was written for lay readers, by an anonymous writer, and belongs to a class of publications upon medicine and allied subjects widely differing in value; while the best of them have their use as educators of the public, they have no standing in professional literature. This belongs to the better class, and historically, apart from being an excellent specimen of early printing, introduces us to the teachers and teachings of dental science as presented to laymen three centuries and a half ago.

Claudius Galen was in continental Europe for more than a thousand years a recognized authority in medical science. He is supposed to have died, in his seventy-first year, about A.D. 200. He was an extensive writer and an original investigator. He did much to systematize the study of anatomy, urging the importance of dissecting the cadaver, and insisting that the bones could be studied only from the skeleton. It is said that he wrote a better account of the teeth than any which had hitherto existed. He taught that

they were formed during the period of gestation; but that they remained hidden in the alveoli until after birth; that the molars of the upper jaw had three roots, those of the lower only two; and that the canine teeth had also received the name of ocular or eye-teeth, because branches are sent to them of a nerve which distributes others to the eye. He has a long chapter on their forms and their evolution, and does not hesitate to pronounce them true bones.¹

Avicenna, the Latinized form of his Arabic name, Eben Sina, was born in Bokharra in 980, and had a checkered career; at one time loaded with favors, and again cast into prison and threatened with execution.

He was, however, a remarkable man and a brilliant scholar. His mental activity took in a wide range. He was master of all that pertained to the classics and sciences of his age and race. As a medical writer his reputation rests chiefly upon his "System of Medicine," a voluminous work, embracing anatomy, physiology, materia medica, and an exposition of all the diseases to which man is subject. Originally written in Arabic, it was later translated into Hebrew and Latin, and for six centuries continued to be the recognized text-book of medical science through Asia and Saracenic Europe. No author since Galen had enjoyed so wide or so extensive an authority in the medical world. Like many another genius, while expounding the laws of health to others and teaching them how to live, he sadly neglected to practise his own precepts. After spending the day in close study and research, his nights were devoted to dissipation and pleasure. Although possessing a sound and vigorous constitution, this disregard of his own teachings ended his career at the early age of fifty-seven.

Regarding Mesue there is much confusion. There were two of that name, both Arabian physicians, and both writers upon medical topics. The first was born in 777, and died about 857; the other Mesue lived about a century later. It is very difficult, if possible, with any degree of accuracy to separate the writings of these two distinguished men. We have not in full the writings of either, and that which we have, through its many rewritings and translations, has been so thoroughly intermingled and undergone so many verbal changes that it fails to correspond with quotations of contemporaneous writers which otherwise would serve to establish their identity. The earlier Mesue wrote more extendedly and confined himself more closely to medicine.

¹ Nasmyth on the Teeth. London, 1839, p. 3.

Cornelius Celsus is supposed to have lived during the first half of the first century of the Christian era, the exact date is not known. "Roman literature, otherwise so barren of good medical authorities, can boast of possessing in Celsus one who for elegance, terseness, learning, good sense, and practical information stands unrivalled." The above quotation, from an able writer, indicates his place in medical literature. He wrote a large work, somewhat on the plan of an encyclopædia; of this, unfortunately, the medical part alone has come down to us, in eight volumes, comprising a history of the various medical schools which had arisen before his time, rules for preserving the health, and the general symptoms and phenomena of diseases, diet, surgery, etc.

Johannes de Figo, a name not found on the title-page but freely quoted in the text, is the Germanized name of Giovanni da Vigo,¹ an eminent surgeon, a native of Genoa, who, in 1503, was invited to Rome by Pope Julius the Second, who made him his first surgeon. His work, entitled "*Practica in Arte Chirurgica copiosa*," first published at Rome (1514) in folio, became extremely popular and was very frequently reprinted, both in the original and in translation. While making these notes I had before me a number of editions ranging in date from one in old Latin, dated 1521, entitled "*Opera domini Joannis de Vigo in Chyrurgia*," to a translation in English, dated London, 1571. It contains a short chapter on the anatomy of the teeth and jaws, and a much more extended one on toothache; from this the quotations in the little book are taken. In this chapter, cleaning cavities of decay and filling them with gold leaf to preserve the remaining portion of the tooth is referred to in much the same terms as the quotation credited to Mesue. It is in such dissertations as this that the world's accumulated dental knowledge, prior to the advent of a distinctive dental literature, has been transmitted to us. They are well worth a careful study.

Pliny was not a medical writer. He was born A.D. 23, and although all his life in the employ of the state was a prolific writer. Among his many works was one upon natural history, published A.D. 77. It is from this work the extracts in this little book have been taken. Its contents were of very unequal value, details that are strange and wonderful rather than those really important having often attracted the author's attention.

Whoever the author of this old dental book was, he has con-

¹ Such lingual variations in proper names are quite common, and are at times embarrassing. This work, in some editions, is known as "*Vigon's Surgery*."

fined himself in making his extracts to strictly standard writers, and in so doing simply followed the custom of medical writers of his day. It was not a progressive age, but rather one in which age and antiquity commanded more respect than real merit. We will now rapidly glance over its contents.

It is divided into thirteen chapters, with titles as follows:

- I.—When the Teeth grow, and how many a Man has.
- II.—The Various Causes of Bad Teeth.
- III.—How to assist Children that their Teeth may grow easily.
- IV.—Of Toothache.
- V.—Of Hollow Teeth.
- VI.—Of Teeth on Edge.
- VII.—Of Yellow and Black Teeth.
- VIII.—Of so-called Sleeping Teeth.
- IX.—Of Loose Teeth.
- X.—For Worms in the Teeth.
- XI.—Ulceration, Bad Smell, and Decay of the Gums.
- XII.—How to draw Bad Teeth.
- XIII.—How to save the Teeth.

The preface reads, translated, as follows: "The God that is almighty, the God to whom all things from the beginning are known, has been pleased in his wisdom to so order that the lower animals and likewise men are provided with teeth, firstly, to secure their food, also to make the first preparation of the food that nature's work may be properly performed.

"The stomach (so the organ to contain the food is named; if it is so treated that it becomes weak, all the other organs will grow weak) first receives the food immediately after it is prepared by being cut up by the teeth.

"Note the above, and take care not to cross the stomach too much, or to goad it, lest it become sensitive and in consequence inflict pain.

"However, the teeth are not exclusively preparers of the food. They have an important office as formers of the voice or speech. The tones of nature, and also of men, striking in proper order the teeth and the tongue, are so controlled that they become now the loud or again the charming voice.

"As Pliny says, 'The teeth are necessary to a goodly countenance and to speech.' There are some letters and words which cannot be properly spoken when the teeth have fallen out, or are worn and broken, or have grown short without being broken, and the voice then becomes harsh, without force, and unpleasant.

"When the teeth become bad it is natural that the mouth be kept shut to hide them.

"When a tooth is raised up and seems like a vegetable, to have grown large at the top, and makes one to suffer, it should be shown to an experienced physician with the request that he draw it out at once."

In the first chapter it states, in substance: Some, very few, however, are born with teeth. A few have instead of teeth a single bone taking their place. The teeth usually begin to grow the seventh month after birth, and keep on growing at intervals until there are thirty-two,—to some the teeth come easier, to others more painful; to some sooner, to others later. To many, as Pliny says, teeth grow in their eightieth year. To some, in old age, the teeth fall out and new ones grow, as happened to one man aged one hundred and four. He relates of another that he had two lower jaws, and on each several teeth. These latter are most likely some of Pliny's marvellous tales.

The second chapter, treating of the various causes of bad teeth, enjoins that whenever any mishap occurs to the teeth, which is often the case, it should be promptly met and counteracted by proper remedies before it becomes permanently settled. Care should be taken not only to see that no fragments of food remain between the teeth, but to wash and cleanse them with pure water. Indigestion should be avoided, as it produces vapors, rising from the stomach, which injure the teeth very materially. Vomiting also causes damage to the teeth, but as this is sometimes salutary, the mouth should be immediately refreshed and washed with rose-water and vinegar, or with any other purifier. All food detrimental to the teeth, such as dry figs, boiled honey, garlic, fat things, sour apples, and such things as set the teeth on edge, should be avoided. Care should be taken not to bite on hard things, to avoid too hot or over cold food; beware of quicksilver, or salves in which there is quicksilver, especially to take care if it is put on heated coals, its vapor does not enter the mouth and touch the teeth; in handling it, do not put the fingers in the mouth. Nor should we go to sleep after a heavy meal, for this will also damage the teeth. The precepts in this chapter are all credited to Avicenna and Mesue.

In the third chapter, how to assist children that their teeth may grow easily, it is advised, children to whom teething is painful should be often bathed, after which the gums should be gently rubbed with the finger, the finger having been first dipped in

chicken-, goose-, or duck-fat, and pressed upon the spot where the teeth are supposed to make their eruption. It enjoins watchfulness, when the second teeth are erupting, that the first tooth is removed as soon as it is seen to be impeding the progress of the permanent tooth. If the second tooth has been pressed out of place as soon as the first tooth has been removed, the new tooth should be pushed every day towards the place where the first tooth was until it sits there and fits in among the others. This chapter is also credited to the writings of Avicenna and Mesue.

The fourth chapter, on toothache, begins by saying, "What toothache or pains in the teeth are, knows no one better than he who has experienced them, and I think there are no greater pains than these." Toothache may originate from a bad state or a destruction of the blood-vessels entering the teeth. Three ways of stopping the pain are given, credited to Johannes de Figo. They are, first, care in eating and drinking; second, by bleeding and purging; third, the taking of medicines, either simple or compound; these are of two kinds, one to stop the pain coming from heat, the other that coming from cold, a distinction, he adds, we cannot afford to lose sight of. Then follows a list of remedies it is not necessary to repeat. This chapter is credited to Johannes de Figo and Avicenna.

The fifth chapter, on hollow teeth, is particularly interesting. It treats of decay of the teeth, and, quoting from Mesue, says it may be stopped in three ways. First, by purging; second, by destroying the matter which hollows them out and eats them away. This is done by boiling cockel, that grows in rye and wheat, with vinegar, and holding it in the mouth, or vinegar in which capers-root with ginger is boiled; third, by getting rid of the hollow, which is done in two ways. The first is to scratch and clean with a fine chisel, knife, file, or with any other suitable instrument the parts attacked, and fill with gold leaves, for the preservation of the remaining part of the tooth. Presuming this to be reliable, the operation of filling cavities in carious teeth with gold, for the purpose of arresting this destructive process, was known to Mesue more than a thousand years ago.

The next chapter, on teeth on edge, contains nothing of interest. It is credited to Mesue and Figo.

Chapter VII., on yellow and black teeth, and the next on sleeping teeth, are of but little interest.

The ninth, on loose teeth, gives us an intimation of pyorrhœa. Teeth loosened by accident it directs to be bound to the sound teeth

with silk or gold thread, using light and soft food and astringent mouth-washes.

The remaining chapters have no present interest.

Between this little book, compiled from authors most of whom had been dead when it was written from five hundred to more than a thousand years, and which may truly be said to belong to ancient dental literature, and the next which I show you, written by Bartholomew Eustachius in 1563, dental bibliography records but three works. Judging from the titles, I take them to be much like this which we have examined, and to possess but little other than historic interest. During this interval, however, modern anatomy was born, the chains of time-honored traditions were broken, the science of medicine and all that relates to it received a new impetus, and modern dental literature received its first contribution.

It requires courage, confidence, and indomitable energy to inaugurate a new departure that antagonizes to any marked extent the accepted doctrines of the day; far more did it require it when men were much less in a receptive mood than now, and were more firmly wedded to ideas that for a thousand years had been accepted without question. Andreas Vesalius was fully equal to the task when, in 1545 or thereabouts, he boldly disputed the anatomical teachings of Galen, dared to point out his errors, and contended that, as the greater part of Galen's descriptions had been made from monkeys, they did not correctly represent human anatomy. His audacity raised a crowd of vehement opponents, but although they silenced this doughty reformer, he was not vanquished; he did not quit the field until he saw the good work he had inaugurated fully established. He contended that anatomy must be studied from the cadaver itself; that the time-honored doctrines of long dead masters did not contain all there was to know. Having succeeded in awakening a spirit of inquiry, he retired from the professorship of anatomy at Padua he had so well filled, to accept a position at the court of Madrid, and was succeeded by Gabriel Fallopius, the discoverer of the Fallopian tube, a distinguished anatomist, who by his researches greatly advanced the science of special anatomy.

About this time Bartholomew Eustachius, the third master in anatomy of the triumvirate who are recognized as the fathers of modern anatomical science, the one with whom we as dentists have most to do, appeared upon the scene. His birthplace is unknown. He is said to have been a pupil of Vesalius at Padua, but he early settled at Rome, where he pursued his studies and practised as a

physician. Although his genius was recognized, and he had wealthy patrons, he was very poor. He at times complained of his straightened circumstances, and that his meagre and uncertain income greatly hampered him in his work. An infirmity of temper, occasionally exhibited in his writings, and his absorbing devotion to anatomical studies, it has been suggested, may account for his poverty, and may also have prevented that full appreciation of his labors that did not come until long after his death. Although he was professor of anatomy at the College della Sapienza at Rome, he was but little known as a teacher, and his fame rests principally on his writings. His works are not numerous; indeed, even a long life is far too short to accomplish much of such exacting, painstaking, and careful work as that which Bartholomew Eustachius has presented to the world. The various papers which Eustachius produced during his life were collected together and published in a volume, entitled "*Opuscula Anatomica*," at Venice, 1563, this little volume which I show you, his work upon the teeth, once formed a part of that volume, it was torn from its companions when it reached some iconoclastic bookseller's hands. I have here the book complete, but of a much later date, published by Adrianum Beman, at Delphis, in 1726. Although published together in one volume, each treatise or essay was complete in itself. The first essay is upon the structure of the kidneys, to which is added much that has been done in that line by Vesalius. The second on the organ of hearing, in which for the first time is described the passage leading from the mouth to the ear, since known as the Eustachian tube. The third is on the bones, in which he enters into a controversy with Vesalius on the knowledge possessed by Galen of the structure of the human skeleton. Eustachius was inclined to defend Galen, or rather his teachings or doctrines, against the stricture of Vesalius. The last of these remarkable essays gives an account of the teeth, and was the first to enter fully into a history of their development. For this work he was fully equipped, his studies in embryology and comparative anatomy, so far in advance of any that had preceded him, were brought to bear upon this work, and have added much to its value. It is regarded as by far his best effort; indeed, in some respects he spoke as a prophet, describing conditions which he knew existed, but which were far too minute for human vision. Many years after his death the microscope revealed the accuracy of these deductions. It seems a pity that this work, so excellent, should have been so much neglected that to many well informed upon dental topics it is quite unknown.

In conclusion, permit me to present this work, "*Tractatus de Dentibus*," or a treatise upon the teeth, by Bartholomew Eustachius, as the first contribution to modern dental literature. It was not a chapter forming a part of some other work, but a work distinct and complete in itself. He says in the dedication "that he had collected together all he could find of that which had been written concerning the teeth; to this he added the results of his own labors in diligent original research, not in the effort to establish some preconceived doctrines or ideas, but rather in the spirit of an impartial and upright judge accustomed to place in order and sift evidence in the effort to reach the truth." His book is a systematic arrangement of so much of this data as, after careful study, proved worthy of acceptance. The title-page of the first edition, published under the supervision of the author, is particularly appropriate: "*Bartholomaei Eustachii Sancto severinatis Libellus de Dentibus*;" which, freely translated, may read, "Bartholomew Eustachius, his little book wholly devoted to the teeth."

It marks the dawn, as it were, of our specialties literature. The beginning of a long series of contributions giving the results of original investigations, of practical experiences, and of profound study, that has not only placed our profession fully abreast of others of the healing art, but in addition has added vastly to *their* resources and usefulness.

THE AMALGAM QUESTION AND DENTISTS WITH "YANKEE WIT."¹

BY CHARLES H. TAFT, A.B., D.M.D., BOSTON, MASS.

MR. PRESIDENT AND FELLOWS OF THE ACADEMY,—One of the incidents of a recent dental meeting in this city calls to mind an excellent paper entitled "Character as demanded in Professional Life," by our esteemed friend, Dr. Eddy, published in the July, 1893, issue of the *INTERNATIONAL DENTAL JOURNAL*. And the thought occurs that there are times in our professional careers when a re-reading of such papers might be of use if we are willing to profit by the helpful suggestions with which this particular paper abounds, and by recognizing the truth of what Dr. Eddy calls the

¹ Read before the American Academy of Dental Science, Boston, January 5, 1898.

"morally painful axiom 'that character in every department of life and action is a good investment,'—that, in fact, 'it pays.'"

It would be difficult for me to emphasize more emphatically this axiom than Dr. Eddy has done, whether it concerns us as dentists or men in other callings or walks of life. But the fact that there are times when men in dental meeting, as well as in private practice, appear to wink at, if not to openly countenance, questionable methods of practice, implying an utter disregard for the existence of any moral law, may well cause us to reflect how important it is to avoid, as Dr. Eddy has said, "by the slightest word or act anything which shall call down reproach upon our profession or upon us as men." The incident to which I have reference was in connection with the discussion of the subject entitled "A Consideration of the Objections offered by Physicians to Amalgam Fillings."

In the effort to show that the statements made by many physicians relative to the at times harmful effects of amalgam were not worthy of serious attention, one of the essayists advanced the argument that these fillings never had been and never could be a source of harm to any one, for the reason that dentists have been filling teeth with this material for sixty years with no serious results, so far as he knew. Any belief on the part of the patient that amalgam fillings were doing him harm the essayist felt was due entirely to the imagination, as could be abundantly proved by the use of a little strategy; and, as an illustration of what I regret to believe is a common practice with some in our profession who are unwilling to investigate in any dignified or thoughtful manner the objections offered to amalgam, the essayist cited a case where "a dentist, making use of a little Yankee wit, had said to a lady who wished to have an amalgam filling removed because it made her sick, 'I will replace this amalgam with silver,' and did so, the result being that she had no further trouble with it."

With the feeling that a subterfuge like this detracted from rather than added to the force of the arguments which the essayist advanced, its recital called to mind two somewhat similar cases in my own practice the past year, the first being that of a lady who said to me as I made an examination of her mouth, "My physician wishes me to tell you not to put any amalgam into my teeth." "I presume you know that you already have several such fillings," I said, upon making the examination. "Impossible!" she exclaimed. "Why, it is only three months since I went to Dr. —, who put all those fillings in. I told him what I have just said to you concerning my own and the wishes of my physician, and kept saying

to him, 'Now, doctor, you are not filling my teeth with anything that has mercury in it, are you?' 'Oh, no,' the dentist replied, 'there is nothing in this material that will prove of the slightest harm or injury to you.' "

To make a long story short, the lady was put to the pain, time, and further expense of having the fillings removed, simply because one of these "black sheep" in our profession, a *dishonest man*, with or without Yankee wit, caring nothing for his own honor and reputation or for his patient's welfare, was, presumably, too lazy and too ignorant to set about ascertaining in any intelligent manner whether the objections offered by the physician in this case were well founded or not.

Now, I submit that any man who, thinking to fool both patient and physician, will deliberately charge and accept a fee for a dishonest service like that fails to appreciate the obligations of his profession, besides placing himself in a very unenviable position.

The second was that of a gentleman who came to me as a new patient. Noticing, upon examination of his mouth, what an exceptionally fine set of teeth he had, and the presence of three or four amalgams where gold could as easily have been inserted, I asked through curiosity why his former dentist had elected to fill such simple cavities with amalgam. He replied, with much surprise, that he was entirely unaware of the presence of any amalgam in his teeth; that he had expressly forbidden his dentist to use it, and the latter had, as it proved, ignored his wishes. The patient left my office with the declaration that "he would make it warm for that man," and with an emphasis that left no doubt of his purpose to make good his word.

Now, gentlemen, my only excuse for bringing this subject before you is for the reason that I have come to take a great interest in it myself, and because I believe this Academy is both able and willing to discuss it intelligently. And because, furthermore, of an ever-growing conviction on my part that we have not begun to appreciate how many people at one time or another become susceptible to mercury, or whose systems are already poisoned from the effects of mercurial medicines in one form or another. Few of us as dentists, I believe, are able to recognize cases of either mercurial susceptibility or poisoning even though there may be abundant evidence standing out, as we say, "as plain as the nose on one's face," and instantly recognized by all who are familiar with symptoms of mercury-poisoning.

I do not hesitate to admit that I once had the same honest con-

viction I know many of you still have that a large class of physicians are entirely in error in the position they have taken relative to amalgam fillings. For a long time I found amalgam too convenient and useful a material in the saving of teeth to practically discard it because of what seemed to me mere whims on the part of physician or patient, and I did not feel at all troubled in a continued use of it, though I knew there was an ever-increasing class of physicians and laymen all over the country who objected to it.

I shall not attempt to convince any one by the use of Yankee wit or sharp practices that the harmful properties of mercury do not necessarily become inert or eliminated when the metal is combined with one or more metals in the form of amalgam, but will ask you to follow me in my method of considering the question, and if there is anything of sophistry in such reasoning as I have to advance I trust no one will hesitate to make it plainly apparent.

Let me begin by repeating a statement which some one has made, and to which I think we can all assent, that "what is one man's meat is another's poison;" for within this statement lies, it seems to me, the key to a solution or to a better understanding of the question. In other words, we are forced to admit that there is a susceptibility in all persons to different drugs or noxious influences varying both in degrees and kinds.

Now, what do we mean by *susceptibility*? Let me offer a definition in the words of one of our friends in the medical profession that "it is an abnormal state of the system, owing to the presence of such morbid forces (generally inherited) which have the quality of attracting other and similar forces, and whose activity is in direct ratio to the lessened systemic resistance." This gentleman goes on to say that "drug forces in the organism follow the same law as acute morbid forces (when uncomplicated) in being self-limited. When drug forces produce an effect upon diseased conditions it is because there exists a certain degree of similarity between them. Drugs aggravate, ameliorate, or change diseased conditions when they have reference to quantity, degree of similarity, and plane of action, while the high dynamizations, instead of antidoting the effects of crude drugs, more nearly comply with the conditions of the sick-producing causes. Man is never made sick any length of time by a drug force unless he presents a susceptibility to its action, and this only proves a similarity of the drug to his condition, which may be curative in the proper potency." Let us consider these statements somewhat collectively and see if they are true.

Take a simple illustration. To a majority of people the common strawberry is a delicious article of food. To a minority it is a violent poison. How do we know this? Not because some one says so, but because we have seen cases where an indulgence in the fruit brings on at once well-marked and characteristic symptoms of distress. By taking note of and systematically recording every abnormal symptom in any part of the system of one who is susceptible to the poisonous properties of the berry we shall acquire definite knowledge as to the physiological action. We shall find that in one person it produces but a single symptom,—a spasm or contraction in the muscles of the throat, which prevents a swallowing of the berry,—while in another person it produces a violent itching and burning sensation in different parts of the body, acute pains and more or less functional disturbance in general. It may affect no two persons alike, and yet when we compare the abnormal symptoms in their totality which the berry produces in a number of people who are susceptible to its toxic properties we find it has very marked characteristics that give it an individuality among drugs when considered as poisons.

Now, drugs which have toxic properties generally have medicinal properties. This is true of the strawberry, and the success which the physician of either of the homœopathic or allopathic school of medicine has in ameliorating or changing diseased conditions lies, I believe, in his ability to meet these conditions upon *similar planes of action*. Herein, too, lies the difficulty with physicians of either school in selecting that drug which, in its medicinal form and upon a similar plane of action, will successfully overcome and cure such conditions.

Now, while we are using the strawberry in illustration, let me say that I have among my patients a lady who from childhood was unable to eat strawberries in any form, but who could, after being *cured* with the same agent in its medicinal form, eat them with impunity. Do not infer from this by any means that the berry in its medicinal form is anything like an invariable specific for the cure of those who may be susceptible to its poisonous properties. That is an error into which many of us fall when we say that if, according to the law of similars, "like cures like," then a dose of strawberry in the medicinal preparation ought to cure one who is poisoned by it. Having, perhaps, tried it, and finding it does *not* always cure, we say the law is a humbug, and those who practise medicine in accordance with such a so-called law of cure are equal if not greater humbugs.

In the case just mentioned there happened to be a perfect likeness or similarity between the diseased condition and the medicinal action of the drug. If, as in other cases, there had been found to exist but a *partial* similarity, its effect in such instance would have proved only *palliative* or *partially curative*, and it would have been necessary to employ some other drug which would have entirely changed or removed the abnormal symptoms. That drug alone which is found to meet the totality of the symptoms will have the desired curative action. It is not a question for us to consider whether the drug be given in the crude or dynamized form to get the best results.

If we can keep in mind that it is always a disturbed condition of the *vital force*, never the material organs and tissues of the body themselves, upon which the action of medicines is to be directed (the restoring of its equilibrium, in other words) we can understand, if we give the matter any thought whatever, that this vital force must be in its very essence a spirit-like force, and that it must be met with a similar force upon a similar plane, when it becomes necessary to restore its equilibrium.

I have used the strawberry as a convenient illustration of taking any drug we please and studying its properties and action in the same manner. In no different way may mercury be studied. I have heard it said in dental meeting that crude mercury is inert, and that in this form a man could take a pound or two without harm, incredible as this may seem. As a matter of precaution, however, I should urge the taking of crude mercury in a less heroic dose by those who desire to make special study of its physiological action. Personally, I should prefer to let the man who has a metallic lining to his stomach experiment with mercury in either one- or two-pound doses.

Substituting mercury, then, for the strawberry, let us consider for a moment some of its effects upon those who show a susceptibility to it.

I have among my patients a gentleman who cannot be in a room fifteen minutes where there is an uncorked bottle of the bichloride of mercury without experiencing a violent headache. In due season, after removal of the exciting cause, the headache disappears. This, to my mind, is conclusive evidence that the gentleman is susceptible to mercury. I should not have to remove his amalgams, if he had any, to be further convinced of the fact, and I assume that you would not ask me to demonstrate with scalpel and microscope the actual presence of mercury globules in the tissues

and cells of his brain, and to furnish you in this way with some really scientific (?) proof that this gentleman is susceptible to and poisoned to a limited extent by mercury. I could not do it were I to try, nor could I prove it in the same manner if I stated that a patient who had chronic headaches was undoubtedly suffering from mercurial poisoning when a removal of the amalgams caused those headaches sooner or later entirely to cease. I have both the written and unwritten testimony of so many patients whose headaches have become a thing of the past with the removal of their amalgams that I am convinced these fillings very often prove a source of evil,—solely because of the mercury, understand me,—though I may not convince others with what appears to be conclusive evidence.

When headaches have reached the chronic stage I do not believe a radical cure is ever effected without good and sufficient cause. I believe the vital force is very often insufficient to combat the influence of a powerful drug force and to be affected by the right medicinal force until the obstruction to its curative action has been removed. In the case of the gentleman to whom I have referred, I have shown that the drug force was sufficiently powerful to throw the vital force out of equilibrium, and I feel confident that had he any amalgam fillings in his teeth a headache would not clear up so quickly as it now does with the removal of the bottle of bichloride.

We know very well that when a dead pulp causes an abscess to form, with a constant discharge of pus from a fistulous opening, no permanent cure of abscess or fistula is possible until the exciting cause acting as an obstruction is removed. We can with well-chosen remedies which control the suppurative process often palliate or cause a temporary cessation of the discharge just as it is possible to relieve headaches in the same manner. But until the exciting cause has been entirely removed a complete cure cannot be said to have been effected.

We may argue, if we please, that cessation or cure of chronic headaches upon removal of amalgam fillings does not prove these fillings or the mercury to be the exciting cause, or that they often act as an obstruction to the action of medicines. No more, then, does the fact that a fistula heals upon the removal of a dead pulp and subsequent treatment prove either the dead pulp to be the exciting cause or that it may often act as an obstruction to the action of drugs which have power to control the suppurative process. No more does a cessation of toothache by the application of aconite and iodine, oil of cloves, or other drugs prove that in some mysterious manner such remedies have had a palliative, if not a

curative action, and been the means of restoring to the vital force its equilibrium. Much of our knowledge comes necessarily from both inductive and deductive reasoning, and is none the less scientific when by means of such reasoning we are able to systematically organize or classify it.

A very good evidence of a patient's susceptibility to mercury is the existence of a metallic taste in the mouth. I frequently hear patients complain of this without giving the matter a thought. How many of us do, in fact? Other evidences of mercurial poisoning are loss of appetite, followed by disturbance of the circulatory system, nervous irritability, and characteristic fetor of the breath. The gums about the necks of the teeth become inflamed, spongy, bleeding, ulcerated, and sore to touch. Salivary glands inflamed, swollen, and also sensitive to touch. Secretion of saliva is augmented and it becomes of a ropy consistence, with offensive taste and smell. An interesting symptom is that of the tongue becoming coated with a white slime and bearing upon its edges the imprint of the teeth. I shall refer to this presently.

Mercury has an affinity for all mucous membranes, especially of the mouth, throat, and nose, producing in the latter great congestion and catarrhal inflammation. It is in cases of chronic catarrh particularly that physicians who are careful and accurate prescribers find themselves so often hampered and baffled in their efforts to cure the patient until all amalgam fillings have been removed. Even then it often requires time to effect a permanent cure owing to the difficulty in removing entirely the poisonous effects of the metal from such systems as have become more thoroughly permeated with it.

The manifestations of mercurial poisoning upon the mucous membranes of the mouth, throat, and tonsils are too well known to be mistaken by one who is familiar with them; though without giving the matter the slightest thought or study we are quite apt to argue that the physician is confounding such inflammations or ulcerations with fistulæ of alveolar abscess or with inflammations of tissue caused by the ragged edges of amalgam fillings inserted by some careless or slovenly operator.

Oftentimes a susceptibility to mercury is the result of long exposure, while again it may be brought about in a very short time. Sometimes the influence of mercury falls upon a single part of the system,—the nervous, for instance,—when as vapor it finds its way to the blood through the lungs, resulting in a paralytic condition.

I remember reading of a case where two barometer-makers

became badly poisoned by sleeping one night in a room where there was a pot of mercury on the stove. One was severely salivated, the other contracted a shaking palsy from which he never recovered.

Rather exceptional cases like these, however, do not prove a general susceptibility to mercury, nor that the majority of barometer- or mirror-makers are poisoned to any alarming extent from continued exposure to the vapor of mercury, any more than the fact that now and then some one working in a match-factory and developing phosphorus-necrosis of the maxillary bones establishes proof of a susceptibility to phosphorus in the majority of factory hands employed.

The symptom of the tongue bearing upon its edges the imprint of the teeth calls to mind a patient whose amalgams I removed while practising in Chicago. An extract from a recent letter in which the patient gives a report of himself may be of interest.

"While the amalgam fillings were in my teeth," he writes, "I had a decided and ever-present metallic taste in my mouth, and on arising in the morning my mouth seemed filled with this taste, which no amount of cleansing with brush and powder would wholly take away. This, however, disappeared with the amalgams. My tongue also showed the imprints of the teeth and does some yet, but they are going away slowly." This gentleman had been a sufferer from chronic headaches, bleeding piles, and other troubles, "all of which," he writes, "have disappeared for good." He adds, "I am now feeling fine in every way."

The fact that the system is often a good while in ridding itself from mercurial taint is well illustrated by this particular case. Sooner or later his tongue will show no imprints of the teeth whatever.

Now, this patient has not the *slightest* knowledge, so far as I know, that the symptom just mentioned is a strongly characteristic one of mercury. How many of us would recognize it as such? Not one dentist in fifty, I will venture to say, would recognize that or a great many other symptoms which a physician is quick to perceive as clearly characteristic of mercury. This, too, is but one out of perhaps many similar cases coming to all of us every day. An examination of the mouth revealing the presence of one or more amalgams affords us neither knowledge nor suspicion that the patient is susceptible to or, perhaps, already poisoned by mercury, whether to a greater or less degree it matters not. Judging by the kind of arguments I have heard advanced by some whose one object is, manifestly, to ridicule rather than to thoughtfully consider

the objections offered to amalgam and to advance any dignified argument against these objections, I am certain it would not afford the *slightest* interest to such men even though there were unmis-takable evidences of it. It is not always agreeable to recognize a *fact*, much less, perhaps, to admit it when recognized.

We say we never heard of any one who was poisoned or harmed by amalgam fillings. Perhaps there is good reason for this. Who does a patient consult when he is sick? Is it the dentist? It quite possibly might be if the patient considered the latter competent to either treat or cure him. He has confidence in our ability to put his teeth in good order and generally consults us for that purpose alone. But in our knowledge of diseased conditions and their ob-scure causes (with the exception of those pertaining to the oral cavity) the average layman, I maintain, has none, and *rightly* so. He would be justified in a similar lack of confidence in the physician's knowledge and skill in matters pertaining to our specialty. For that reason when in need of our services and advice he consults the dentist, not the physician.

But the physician who objects to amalgam on general principles does not deny that, considered as a filling-material alone, it serves a useful purpose in the saving of teeth. He does not assert that all people are at all times and under all conditions susceptible to mercury. He knows, however, that a susceptibility may be estab-lished at any time. He knows, as I, too, have learned, that when a drug force exerts a curative influence upon diseased conditions (or morbid forces) it is because there exists a *similarity between them*. If there is no effect, it must be for want of such similarity, as is the case when medicines are not well chosen, or because there is a stronger force acting either as an antidote or as an obstruction to the action of the remedy.

The objections offered to amalgam fillings by many physicians in both the leading schools of medicine seem to have stirred up a mingled interest, prejudice, and opposition among members of our profession. Many have shown and continue to manifest a desire to discuss the subject for the purpose of finding the truth. A few have argued and continue to assert, in spite of all evidence to the contrary, that the objections come *entirely* from physicians of the homœopathic faith, and for that reason alone are not worth consid-ering, carrying their prejudices so far as to oppose the subject ap-pearing for discussion on the programmes of several dental societies right here in the Commonwealth of Massachusetts, a State in which the right to freedom of thought and speech is, fortunately, seldom

questioned. Such an opposition in *this* city or State by any member of the dental profession who courts such notoriety is too childish and silly to deserve one moment's serious attention.

From my view-point, the opinions of any man or set of men of recognized educational or professional attainment, who earnestly, conscientiously, and successfully devote their lives to the practice of medicine, are entitled to respect and thoughtful consideration. Personally, I respect and admire a physician of *any* school of medicine who, recognizing his inability to effect a cure in any particular case until all amalgam fillings have been removed, frankly tells the patient this. He shows himself at least to be too honest a man to continue taking his patient's money knowing he is not rendering a full equivalent for value received.

Do not misunderstand my position and assume that I would never under any condition sanction the use of amalgam. That it has its usefulness as a filling-material I freely admit, and for a long time I entertained the same thoughts and opinions concerning the objections to it that perhaps a majority of this Academy still do. With an independent study into the merits of these objections, the weighing of evidence as it has been presented to me by patients, and the willingness to recognize and admit as facts things which one could not dispute if he would, there has come a change of opinion on my part. But let no one infer for that reason that I wish to cast the slightest reflection in whatever I have said upon the opinions of any one who honestly differs with me. I do stand here, however, to encourage in *this* society—at least, never to discourage—an open, honest, manly discussion of this or any other subject that is of interest to us or to our patients. An ever-increasing number of men and women all over the country are discussing the question among themselves. Why not we? I believe, moreover, that when a patient tells us it is the wish of his physician that all amalgam fillings be removed, the work should be commenced and thoroughly and conscientiously carried through to the finish unless there is good reason for our wishing to first consult with the physician.

Far be it from me to pose as a moralist or to dwell at length upon the necessity of drawing fine distinctions between what a man's professional conscience tells him is right or wrong so far as his business dealings with patients is concerned. I only wish to emphasize my own disapproval of such methods of practice as those to which I have referred in the early part of this paper, and which, if generally employed, could not fail, and *justly* so, to bring discredit not only upon those who practised them, but upon

a profession which we should wish to see honored, never disgraced. *An honest argument never needs the support of a dishonest trick.*

In conclusion, permit me to say that if I have learned anything which seems of value to me in the study of this question, it is my desire to give the benefit of it to others. The testimony which I have received from those who have experienced the benefits following removal of their amalgams furnishes me, at least, the pleasant satisfaction that in an unassuming way I am often doing what I can to *assist*, rather than *hamper*, the physician in that noblest of all works, the healing of the sick.

In whatever ways as individuals we choose to investigate the objections offered to amalgam, we shall not go far wrong in this or any other line of study which will add something of value to the common fund of knowledge, if we keep in mind the advice of Polonius to his son,—

“This above all,—to thine own self be true;
And it must follow, as the night the day,
Thou canst not then be false to any man.”

SERRATION AN ERROR IN PRACTICE.

BY J. W. WORCESTER, M.D., MIDDLETOWN, N. Y.

HAVING read with much interest your editorial on “The Evolution and Abuse of the Serration” in the March, 1897, issue of the *INTERNATIONAL DENTAL JOURNAL* at the time of its receipt, I have at the present moment again gone over the subject for the purpose of giving you my opinion in the matter (which I hope will be acceptable and of benefit to the profession), not on the “evolution” of the serration, but on the “abuse” of it.

I came to the conclusion some years ago that serrated instruments were a *great mistake* (except with the most careful and painstaking operator), and therefore gave up their use.

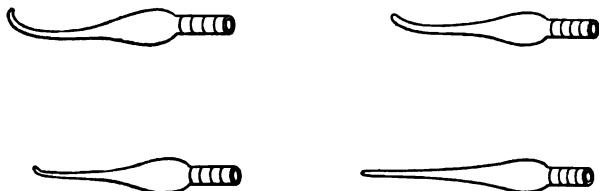
My reasons for so doing were principally confined to the fact that the serrations were the cause of so many leaky fillings through the abrasion or chipping off of the tooth-substance from the walls of the cavity during the operation, and which became more or less incorporated and condensed with the gold, despite the use of the chip-blower.

This bone-dust, being a perishable substance and continuing to

the edges of the cavity in the filling operation, as it invariably is with these instruments, was without doubt, and is yet to those using them, the principal cause of leaky fillings, especially with the beginners and also with many of the elders.

The acid condition so often present around the teeth furnishes means for making a solution of this confined bone-dust, with the result familiar to all.

To overcome the difficulty and make an absolutely tight plug, I adopted the method of using the smooth point, not a burnished smooth point, but one that is rubbed over frequently with a spun-glass burnisher or a medium-grit emery disk, although I use both constantly. These keep the steel point clean and bright, and with the electric mallet, which I use (and which should be preferably used with these instruments), I can weld the gold perfectly solid and intact, and will not injure or abrade the walls of the cavity in the least.



You can mallet around at the junction of the gold and the tooth with these instruments, and the result is a tight joint with *no* bone-dust intermixed.

The instruments I use are round, either straight or curved, with rounded points, such as I here illustrate, and will be found perfectly practicable in all cases for gold work, using several sizes.

I invariably use Watts's crystal gold cubes (which can be welded perfectly with these instruments), without annealing, until I get near the surface, when, with the use of annealed foil pellets of a very light form (smallest size), I bring the filling to a finish and polish off.

My method of preparing the cavities is to first grind or disk away all frail walls around the cavity to a self-cleansing surface and polish. Then I proceed to excavate the cavity with just enough undercut to hold the filling, leaving *no sharp* angles therein, square across at the cervical walls, and round off the edges of the cavity (as it joins the previously polished surface) with a fine finishing bur or fine office-made emery points. The rubber dam is applied and ligated to the teeth and the moisture removed with absorbent

paper, then wiped out with sulphuric ether, and lastly with a solution of bichloride of mercury in chloroform one to one thousand. The cavity is now in excellent condition to fill, and I carry this out in the preparation of all cavities for whatever kind of filling.

After the cavities are filled with a slight overhang I disk down (to the original polished surface previous to filling) and continue to polish until impossible to do so more.

These fillings I find give good service. I would like to see the profession generally take as much pains and do better dental work, and abolish the pernicious habit of using serrated instruments as I consider them an abomination and a curse in the hands of most operators. Let the law be laid down that the use of simple, smooth, scratch-points, as applied to gold work, is the sure road to success and a glorious beneficence to humanity in the field of dentistry. If there is any improvement on these methods I would like to see it.

STUDIES IN EVOLUTION.

BY EUGENE S. TALBOT, M.D., D.D.S., CHICAGO, ILL.

HEREDITARY and atavistic specimens illustrating the evolution of man occur in dental practice, which are of great interest. "Recent discoveries," as Tomes remarks, "have proved that retrogression



is a more common phenomenon in teeth than was formerly supposed." Hence, biology and comparative anatomy in relation to the jaws and teeth are studies of especial value to every dentist.

The degenerate patients of the dentist afford rare opportunities for such study. The illustration nicely demonstrates, from the

dental stand-point, that man as a vertebrate animal sprang from the lower marsupials and lemurs, and that the bicuspid and molars are developed from single root and cone teeth. The illustration shows right and left lateral incisors (Figs. 1 and 2) and right and left second bicuspid (Figs. 3 and 4). The roots are usually long and are considerably curved, thus affording great strength, as in the carnivora. The roots of the bicuspid are composed of three and four smaller roots fused together with grooves showing their outline. The crowns are made up of five cusps each, showing the transition stage from a bicuspid to a molar tooth. The person from whose mouth these teeth were taken was a woman, forty-two years of age. She had a contracted chest, large hands and feet, and thyroid gland. The arms were unusually long, her jaws were large and well developed, face sunken, with high cheek bones, ears large, with right higher than left, right eye higher than left. That such an individual should possess atavistic teeth would seem to follow as a matter of course.

Abstracts and Translations.

PRACTICAL AND THEORETICAL TRIALS OF "FORMAGEN."¹

BY MAX BAUCHWITZ, STETTIN, PRUSSIA.

For more than eight months I have applied formagen in all stages of the inflammation of the pulp, and among over three hundred cases only two extractions were necessary afterwards. Unfortunately, I had the ill luck to receive in the first lot of formagen a preparation which was too powerfully saturated with the formaldehyde vapors, which naturally caused extremely severe pains, lasting for hours and days. Subsequent lots of formagen I received acted, however, almost painlessly; upon the application of the agent there followed only slight "dragging" in individual cases, periostitic irritation had to be recorded, which disappeared partly spontaneously and partly after treatment. Formagen has given splendid results in two of my own molars, one of which, after

¹ Translated from the *Deutsche Monatschrift für Zahnheilkunde*.

repeated but vain treatment, it had already been proposed to sacrifice. I have also to chronicle very good results in a series of pulpitic milk molars; it was applied in children at four years old, and has greatly contributed to the conservation of those teeth which otherwise would have fallen a prey to extraction, as the pulp-treatment with arsenic would in these cases have been out of place.

Thus it appears in formagen an agent has been found—*assuming that it is uniformly prepared, and the troublesome sticking of the cement on the instruments is overcome*—to which must be given the preference before many other medicaments for the treatment of pulpitis. For instance, a patient arrives with severe pulpitic pains; we excavate the carious tooth, the pulp is capped with the soft formagen cement, a filling is placed over it, and the patient, who was so fearful of the "nerve-killing," leaves the operating-room with only slight or mostly no pain at all. We, on the other hand, have the satisfaction of not having destroyed an organ as was done hitherto with arsenic, but, faithful to the principles of the healing art, to have preserved the organ which brings life to the tooth,—namely, the pulp,—with prospective *lasting* results. With this last I come to the question which every scientifically educated surgeon has a right to put to himself, but which up to the present has remained unanswered, *How does the formagen act upon the pulp?* Purely empirically, and, according to the expressed symptoms of the patients, which I am able to confirm by my experiences with my own teeth, formagen, which consists chiefly of carbolic-eugenol and an indifferent porous powder saturated with formaldehyde vapors, stills the pain almost instantly after the agent has been applied to the irritated pulp. Here it is that the well-known anæsthetizing action of the carbolic acid takes effect, which arises in this way, that it paralyzes the sensitive nerve-fibres of the pulp, and, furthermore, eugenol, the oxygenous constituent of oil of cloves, also acts as an anæsthetic. According to Liebreich, a local anæmia is not produced by the employment of eugenol, as with cocaine, but sometimes a painful sensation occurs, which the patient describes as "dragging"; this pain is connected with a rapidly transitory hyperæmia. The "dragging," indeed, is very soon felt on the application of formagen; it is, however, partly also to be attributed to the formaldehyde vapors, which develop rapidly and penetrate the pulp; and the more concentrated this penetration the more will the "dragging" rise to a real sensation of pain, as I will show later on. Under the filling which immediately follows, the pulp

reacts normally and is sensitive to all injuries, whatever their nature may be, just as in healthy pulps. Now, in order to learn by means of theoretical and more instructive experiment the action of formagen and the changes produced by it in the tissue, I made a series of bacteriological investigations, such as were undertaken by Miller in his classical work, "Ueber die Mikroorganismen der Mundhöhle," on the pulp with the most varied antiseptics. For this purpose, like Miller, I chose the fleshy pulp of calves' teeth, which pulps, partly whole and partly split, I filled into a small tube which below ended in a pointed orifice. From this fine opening of the small tube, where mostly that part of the pulp came to lie which is situated at the apical foramen, I infected the pulp with bacteria of freshly extracted pulpitic teeth, and applied at the same time at the opposite end of the pulp—namely at its crown portion—the formagen, which I sealed with wadding and wax. The tube was placed with the infected part of the pulp into a reagent glass, which was partly filled with agar-agar culture, and was then deposited in the incubator at the temperature of the body. By this means I was able to observe from without the penetration of the formagen into the pulp, and thus also the process of putrefaction which might perhaps arise.

After one day the reddish pulp was converted on the surface into a solid, jelly-like structure, which on the second, third, and fourth day, and so on, became uniformly tough up to the extreme point. The peculiar pungent, formalin odor was completely maintained, and nowhere were processes of putrefaction to be observed. *Macroscopical and microscopical investigations demonstrated that no bacteria were present.* The macroscopical investigations were arranged in such a way that I transplanted the pulps, which were taken out of the small glasses, upon plates or saucers with agar-agar culture, and these again were deposited for various periods in the incubator. The plates remained completely sterile, *and hence is proved the extremely powerful disinfecting and antiseptic quality of formagen.*

Another question was, Does formagen act destructively upon the pulp-tissue, upon its nerves and blood-vessels, or does it conserve them? In order to answer this question, the pulps which had been treated in the manner mentioned above were fixed, and with the microtome sliced into extremely fine longitudinal and transverse sections. For confirmatory trials fresh calves' pulps were converted into preparations and examined microscopically like the former. The pulp treated with formagen showed, on

the whole, the same picture as the normal ones. But with the former the blood was coagulated in all the vessels; the red blood-corpuscles, lying closely against each other, resembled a homogeneous brown-red pillar. The nerves appeared intact. As the blood-vessels had the same appearance also in the finest and most extreme ramifications of the pulp, it is to be assumed that the formaldehyde vapors set free had penetrated the entire pulp. Therefore the mode of action of the formagen would be as follows: On their application to the inflamed pulp the carbolic acid and eugenol act first anæsthetically; the latter a short time after produces a gentle dragging pain, by increasing slightly the hyperæmia present already with the inflammation. Shortly afterwards the formaldehyde vapors in the formagen stream gradually through the whole of the pulp tissue; they kill all pathogenic germs, and convert the pulp *in toto* into a jelly-like homogeneous mass, and stasis occurs. While stasis is naturally first formed in the blood-vessels lying nearest to the point of application of the formagen, these vessels receive new blood from below through the apical foramen, whereby the pressure in the vessels, narrowed through the stasis,—the vessels being full to bursting through the hyperæmia already existing in inflammation, and that called forth by the eugenol,—becomes so great that a portion of the sanguineous fluid is pressed through the vascular walls. This blood liquid is absorbed greedily by the porous powder contained in the formagen. By this means the vessels, which had severely pressed upon the nerves lying near them through their increased volume and thus caused pain, are relieved of the weight, a new circulation of the blood occurs, and in a short time after the pulp is in a condition to perform its function normally. A preparation, however, too strongly saturated with formaldehyde vapors acts too intensely and violently upon the blood-vessels, the pressure of the vessels, which have become suddenly and violently distended and burden the nerves, becomes over great, and thus perhaps is explained the severe pain, which I have often observed where the formagen has been too much saturated. On the basis of these experiments I have come to the conclusion that formagen can be recommended with a good conscience as a valuable agent closely approaching to Miller's ideal. It is not to be used in periostitis, as Abraham has pointed out already.

Finally, I should like to add here that my experiments have brought me to the conclusion that formagen does not influence plastic filling-materials prejudicially.—*Journal of the British Dental Association.*

Reports of Society Meetings.

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held at Young's Hotel, Wednesday evening, January 5, 1898, at six o'clock.

A paper, entitled "The Amalgam Question and Dentists with 'Yankee Wit,'" was read by Dr. C. H. Taft.

(For Dr. Taft's paper, see page 344.)

Dr. Taft.—Mr. President, before the subject is thrown open for discussion, I want to speak of a case which I had in hand last week.

A former patient of mine, who had removed to the western part of the State, where she has lived for the past five years, was visiting Boston, and came in for an appointment. She told me she had been having constant trouble with her throat for the past few years, and without being able to obtain any relief; that she had made arrangements, by the advice of her physician, to go to Southern California for a year. Her physician confessed to me that it was the worst case of sore throat he had ever seen. He had tried all kinds of remedies and treatments with no effect whatever, and she was unable to eat with any comfort because it was so painful for her to swallow. I made a superficial examination of the mouth and found the hard palate badly inflamed and the tonsils covered with ulcers. I remembered that I had several years ago put in three or four out of the eight or nine amalgam fillings that she had in her mouth, and I said to her after some little conversation, "I believe your trouble is greatly aggravated not only by the red rubber plate, but by all your amalgam fillings."

"That is just what my physician said," she replied. He was an allopathic physician, by the way, and had told her over a year ago that he had in mind sending her to her dentist to have the amalgam fillings taken out, but he thought that in any event a change of climate would have a very beneficial effect. I felt a great deal of interest in this case, and advised her not only to never put that red rubber plate in her mouth again, but to allow me to remove those amalgam fillings without expense to her. She agreed to this, and the work was completed day before yesterday. She came into

my office yesterday morning and said to me, in a laughing way, "I certainly do feel better already, but whether it is due to imagination or not I cannot say. I haven't that 'blistered' feeling in my throat, and if it were not that arrangements have been so fully completed, I believe I should be almost tempted to give up going to California." I said to her, "If you are better, I am glad of it. I shall hope to hear, after you have reached California, not only that your throat is improving, but that you are fast gaining health, and I should advise you, when you go home again, to put that red rubber plate into the fire." She agreed to do it.

I shall be very much interested in watching this case, and will report to the Academy further in regard to it. If we find she gets better, we can attribute it to the imagination, to the change of residence, or to the removal of the amalgam fillings, whichever way we happen to feel about it.

Dr. Allen.—When Dr. Taft invited me to open this discussion of a somewhat unpopular subject, I suspect he did so because I represent some of the views of a minority of dentists and physicians who hold that the presence of mercury in amalgam fillings is, under certain circumstances, prejudicial to the health of the patient.

It is not my purpose to offer any new argument in support of the views so well presented by our essayist in the paper just read, as well as in those presented by him on previous occasions. His plea for a calm consideration of the subject, based on clinical and experimental investigation, is the point which I desire to emphasize, and which ought now to guide us in our discussion. Let us approach the question as students, seeking whatever truth lies hidden therein, for in doing this we shall only follow the rational methods of the lover of science, and thus avoid useless controversy.

I do not profess to have wholly discarded amalgam from my practice. I occasionally find it useful in spite of its many defects as a filling-material, and shall doubtless use it more or less until a satisfactory substitute is found.

The susceptibility to the effects of mercury, as well as to other drugs, varies greatly with different individuals, and perhaps with the same individual under varying circumstances. It may be the exception for one of our patients to be at all affected by the mercury contained in amalgam fillings; but the fact appears to be well established of persons having been even seriously affected by this substance, which has been so indiscriminately used in the mouths of our patients by many members of the profession.

Our use of drugs being rather limited on the whole, and largely

confined to local applications, we cannot claim to be expert observers of their more obscure physiological effects. On the other hand, when the physician, whose business it is to know just what a drug is capable of accomplishing in the human organism, has reason to believe that his patient is susceptible to small quantities of mercury, the dentist, unless he possesses superior knowledge of that particular case, should hesitate before assuming the opposite opinion.

We have had the experience in our dental meetings of hearing this subject treated with ridicule, and with expressions of personal prejudice, *pro* and *con*, much to the regret of those who appreciate the efforts and motives of the intelligent truth-seeker. It is to be hoped, therefore, that we will not pass this subject without a show of interest in its truly scientific aspect.

Dr. Bradley.—Whether we agree with the essayist or not, I think we shall all be willing to give him credit for a paper written with the purpose of presenting this subject fairly and judiciously. I was surprised to learn from his statement that there were dentists who would pretend they were filling the teeth with one material while they were using another. No conscientious dentist would do such a thing. Whether we agree with the writer's theory or not, we should let the patient know, if he asks for the information, what we are doing for him, and without any ambiguity in terms. If a patient desires that his tooth shall not be filled with amalgam, we should do the best we can with some other material. We certainly should not deceive him, for it is not professional.

In the course of a conversation with a prominent physician of the old school, he asked me about rubber plates and whether I ever noticed any ill effects from them. He gave it as his opinion that no person should ever wear a rubber plate; that they were exceedingly injurious to the membranes of the mouth, and he drew for me a diagram of one made from compressed paper. He said that they now make almost everything of compressed paper, and it would be lighter and would not poison the mouth. He was very sure that the rubber with mercury in it was injurious to the throat. Dr. Taft claims that the objection to mercury is not confined to the homœopathic school, and I merely speak of this as one instance corroborating his claim. I use amalgam fillings, and believe they are a great help in saving the teeth, and yet at the same time believe in the homœopathic system of treatment. I would like to know more about this. I believe that amalgam fillings are valuable in saving the teeth, and yet if my patients requested me not to use amalgam, I should comply with their desires and substitute some-

thing else. I would try to be honest with them, at all events. As Dr. Taft quoted very pertinently, I would be "true to myself," and in that way would do them no wrong.

Dr. Barker:—I have been wondering whether it was because of the dislike the members have of revising the stenographer's notes that they refrain from saying anything on this subject. Manifestly, the only way we can tell whether strawberries are going to poison us or not is to eat them. If they do, we shall be obliged to give up eating them. Manifestly, also, the only way we can tell whether amalgam fillings are injurious to a person or not is to put them in and note results. If they do prove injurious, really and actually, or if some physician thinks they are, then we can take them out and do the best we can with other materials. But I submit that until it can be proved that strawberries are injurious to the human race, as a whole, we shall continue to cultivate and eat them, and I submit likewise, Mr. President, that until it can be proved that amalgam fillings generally, or even in a small minority of cases, are injurious, the dentist who has a general practice to conduct and who has to take into consideration a variety of things, and among others the ability of the patient to pay fees, will be compelled to use dental alloys.

I have not the slightest disposition to ridicule this subject. I want to hear all the objections that can be brought up against amalgam by those who are making a study of it; it is certainly a subject the Academy ought to consider.

Is there any way by which the mercury we combine with an alloy and insert in a tooth can do injury, except as it shall become volatilized and taken into the system, and cause a loss of weight in the filling. Has any one inserted in a tooth an amalgam filling the weight of which he knew absolutely, and, after a time, taking into account the loss which would result from attrition, has he carefully removed the filling and ascertained whether it had lost weight, and if it had, has he ascertained whether a disproportionally large amount of mercury is lacking or not?

I remember reading somewhere the report of a committee appointed to investigate the possibilities of injurious effects from red rubber plates, and their report, after having made a thorough and exhaustive investigation, was to the effect that there was no evidence whatsoever, that they were able to obtain, that the mercury that had been present in the rubber plate had been lost after a certain length of time. The mercury did not get away from the plate and get into the system, and if it did not, how could it do

harm? Does the mere presence of the mercury, either alone or combined with the alloys, produce unfavorable results? If it does, then, of course, we ought to determine in the case of each individual patient who presents himself to us for our services whether the risk to that patient is sufficiently great to justify us in denying him the use of amalgam, and in substituting therefor gutta-percha or zinc phosphate, or in being charitable and putting in gold. The essayist admits that there is no general over-susceptibility to influence of mercury, or to amalgam fillings, and it occurred to me that, as we save thousands and tens of thousands of teeth every year by their use, we had better continue their use until we find a case where there is pretty good evidence that they are poisonous to a certain patient, then let us remove them and put in whatever the patient demands or whatever they can pay for.

It is an old subject, it has been threshed over and over, and yet I presume there are some grains of wheat yet in it, and I am glad to see the Academy is willing to try to find them. Let us meet the question in a fair and candid spirit, and I have no doubt we shall find some profit in the discussion of it.

Dr. Andrews.—I wish in the first place to congratulate the essayist on the very admirable way in which he has presented the subject to us.

I shall speak for a moment on one phase of this question, and that is, the power of mercury to penetrate minute canals. It is a fact, gentlemen, that globules of mercury are forced into the dental canals, and in the case of pulpless teeth forced through the canals to an incredible extent. It is perfectly surprising how mercury will travel into minute openings. Some of you have bought your mercury in the little wooden bottles as put up by some of the supply houses. If you split these bottles open, you will find mercury running all through the grain of the wood. I remember having shown the Academy, in one of my demonstrations on tooth-structure, a section of a tooth that had been filled with amalgam, a section having the canals of the dentine completely filled with the minute globules of mercury; now, when we reflect that those canals are only about one-ten-thousandth of an inch in diameter, we can see that mercury forces itself into very minute openings. I am making a series of investigations on freshly extracted teeth, that had live pulps when they were extracted, with an idea of finding whether these globules will penetrate into the canals when the fibrils are still present. I will give the results of these investigations at a later meeting. I have here one of the wooden bottles which has

held mercury. I shall pass it around with a magnifying glass, and you can see for yourself the globules of mercury in the grain of the wood. It looks as if you had taken a lead-pencil and drawn a very fine line in the interior of the wood. When I discovered this fact, I notified some of the manufacturers that, by placing the mercury in the wood just as it was turned, they were really wasting some of their mercury, and we were not getting the benefit of all we paid for, because the mercury was forcing itself into the substance of the wood. There has since been an effort on the part of the bottlers to guard against this by varnishing the inside of the wood with some thin varnish and letting it dry. It was thought that by doing this it would fill up the pores of the wood and make a surface that would not take mercury. I show you to-night, however, some bottles that have been varnished, and the mercury still runs down into the fibres of the wood. I have mounted a number of sections taken from different pieces of these wooden bottles; in some of which the openings are quite minute, but they are completely filled with mercury. It has been my practice for several years when filling teeth with amalgam to line my cavity, and I think it is the best practice. It not only gives you a clean tooth, but prevents the possibility of the mercury going into the tooth-structure. I use amalgam where I think its use is indicated. I tell my patients before using it that there are objections to its use by some physicians. I tell them that I do not believe such fillings can do harm. At the last meeting of the dental section of the American Medical Association, held in Philadelphia, the subject of amalgam fillings was brought up by Dr. Bonwill. He wanted very much to have a committee from the dental section examine the mouths of some of his patients. It was voted to have a committee call at Dr. Bonwill's office the next morning and make the examination. At the appointed time the committee met at Dr. Bonwill's office, and found that he had collected about forty persons, the majority of whose teeth were found filled with amalgam, and Dr. Bonwill wanted to show that amalgam, when properly used, would not produce ill effects. I do not think there were ever seen a healthier set of mouths, and this was the unanimous voice of that committee.

I would urge that before you put in amalgam fillings you would line each cavity with some kind of cement. In the cases of large fillings I make a practice of filling the cavity partly with oxyphosphate, packing the amalgam into this. I think it is on record that gold is a dangerous article to use in the mouth in some cases, and I remember reading a paper describing the bad effects which the

writer had noticed caused by filling teeth with oxyphosphates and oxychlorides. It may be that there are some such cases, but I doubt very much if amalgam, properly used, will do any harm in the large majority of cases.

Dr. Banfield.—May I ask Dr. Taft, if he entirely discards the use of amalgam because of these few cases in which he has noticed bad effects resulting from its use?

Dr. Taft.—I have practically discarded it. I do not use on an average an ounce in a year.

Dr. Banfield.—If that is so, Dr. Taft goes a step further than physicians in the use of drugs. Not long since being lame and sore from the effect of a cold, various remedies were tried without giving relief; finally rhus tox. cerate was applied externally.

This remedy had been used by others through the advice of a physician for rheumatic troubles and had produced no disagreeable effects. The following day wherever the application had been made an eruption appeared, which caused much suffering and confined me to my bed for several days. I afterwards made inquiries of Otis Clapp & Co., manufacturers of this drug, and learned from them that occasionally similar disturbances arise, but that as the cases are so few physicians do not consider it necessary, in prescribing it, to especially caution patients in its use.

Now, here is a drug that does irritate in some cases, and is a poison to some persons, but because of these few, isolated cases physicians do not discontinue its use, so I do not see why we should discard amalgam because it creates a disturbance in a small percentage of cases.

Dr. Smith.—This is the old case of amalgam on trial. Certain medical practitioners allege that amalgam fillings are poisonous, injurious, and should not be used. They have settled that matter for themselves, and from their stand-point it should no longer be discussed. I understand a bill has been, or will be, presented to this Legislature, prohibiting dentists from using amalgam as a filling. No dentist, if he can be convinced that amalgam is injurious, would wish to use it; in fact, from a pecuniary stand-point, it would be beneficial to him if he could not use it, because it means in cases where gold is contraindicated that he has the opportunity to fill and refill and fill again. Therefore, from that stand-point, from the sordid stand-point of gain, he should support that bill. But, on the other hand, gentlemen, see what hardship it works upon the poorer class of people who cannot afford gold and are obliged to undergo the expense of replenishing cements and gutta-percha, and none

here, I think, will deny that the cements and gutta-percha do need replenishing, and oftentimes at the expense of the tooth-material.

Now, to prove this claim that amalgam is injurious these gentlemen cite cases similar to those which the essayist has cited in his paper,—cases where they have treated certain troubles with, as I presume, the proper remedies, and, finding no headway, have had amalgam fillings removed, with the pleasure of seeing the patient go on to a speedy cure. Now, what is the offset to those cases? In my practice I have had two, of which I will speak, and possibly, if we are observing, we may find still more evidence in the same line.

A certain patient was in my hands for the care of her teeth, and also in the hands of a prominent homœopathic physician for some other trouble; knowing the fact that she was being treated by a homœopathic physician, I never thought for a moment of using anything in her mouth but cements and gutta-percha. That patient continued under treatment for two years. If that patient had had amalgam fillings, they would have been ordered out as being the cause of her trouble, and had she recovered in that time, the conclusions would apparently have justified this belief. Circumstances called her to another city, where she was treated by an equally prominent homœopathic physician, and one who supported the high potencies with as much fervor as her physician here. She also came into the hands of another dentist, who, probably, knowing nothing about the objections of homœopathic physicians to amalgam, removed the cements and gutta-percha and replaced them with amalgam, so that when she came under my notice again I was surprised to find those molars well filled with amalgam, and the patient was perfectly well. Now, if the argument is good on one side, that amalgam fillings prevented the cure, then that same argument holds good on the other side,—that putting in amalgam fillings cured her. To my mind, if one is good logic, the other is equally good logic, and I do not see how you can escape it. I have had two such cases.

I think that this charge against amalgam is still unproved; but I do admit that there are idiosyncrasies on the part of some people, and that they may be susceptible to amalgam, and that it will affect them in peculiar ways. We also know that bicarbonate of soda will produce a severe inflammation of the mucous membrane in some cases, yet we would not go before the Legislature with a bill prohibiting the use of bicarbonate of soda as a mouth-wash.

From these high potentists comes the assertion that a large number of suicides are caused by the presence of gold in the teeth.

I am merely stating facts, gentlemen,—and if to state facts is to ridicule, then let it be so. Aurum is a specific for certain mental troubles, and it is believed by certain physicians that so much gold in the mouth tends to produce these troubles. Then we are told that by removing salivary calculi from the teeth they drop out. Again, some physicians say that a fistulous opening should not be cured. These physicians will not allow the dentists to use drugs for curing them, because they claim that it is a condition that nature has established to relieve impurities, and, therefore, the drainage should be allowed to go on. I have heard physicians make this statement. And now, Dr. Andrews says that charges have been brought against oxychloride and oxyphosphate. Well, if all these alleged charges can be sustained,—that amalgam is injurious; that gold is injurious; that the removing of tartar must not be allowed; that in our treatment of abscess we must not attempt to close up a fistulous tract, then “Othello’s occupation is gone.”

Now, I use amalgam in my practice, discriminately, as I use all other fillings and drugs, and I believe, with the essayist, that no man would be justified in deceiving a patient as to the material he was using because he himself did not believe that material would injure the patient.

To refer to another case of mine in which amalgam fillings figured as the bone of contention: the patient’s teeth were badly decayed and I had filled them with cements and gutta-percha until I was thoroughly discouraged, and I suggested to this patient that she allow me to put in amalgam, knowing that her physician was an allopathic physician who would probably not object to the use of amalgam, and she did allow me to do so. She is a woman who abuses herself in following fashionable society, and in the midst of a society season she suffers more or less from stomach trouble and always did, and I have felt that her distress was due to the abuse which she gave herself rather than to any lack of physician’s skill to cure her. Not getting relief which she looked for, she broke loose from the allopathic physician and went to a prominent homœopathic physician for medical advice. The first thing he asked was if she had any amalgam fillings in her mouth, and on receiving her reply in the affirmative, he told her she must have them removed at once. She returned to me, and wanted them removed at once, believing them to be the cause of her not gaining her health. I told her that I did not believe the amalgam fillings had any effect whatever upon her health, and that their removal would be simply a matter of more expense and more trouble to her. I removed those fillings and put

in cements and gutta-percha again, and she followed the treatment of the homœopathic physician, but without obtaining the desired relief. Finally, she went back to her allopathic physician, and after a time began to improve. Now, if she had improved in health while under the treatment of that homœopathic physician, she would have alleged that the amalgam fillings were the cause of her keeping in poor health, but in this case, even after the removal of the amalgam fillings, she continued in ill-health.

Speaking of inflamed spots and ulcers, I have seen them caused by ill-fitting rubber plates, and you will see that same inflammation under ill-fitting gold plates.

Dr. Werner.—I feel that every one of us would like to speak on this subject, and it would take a long time to express all our notions and partial knowledge on the subject. Were I to ask the members here if they generally believed that there can be free mercury in an amalgam filling, most would reply, "No." I was of that opinion, but lately I have been convinced that there is free mercury in some amalgam fillings. I have pieces of gold here that touched an amalgam filling and will pass them around. If you believe in homœopathy, you will naturally believe that an amalgam filling that had free mercury would be injurious. I do not wish to ridicule homœopathic methods and principles, but if I were sick, I would not expect much help from a thousandth part of a drop of medicine. I remember an excellent article by Dr. Holmes in the *North American Review*, on the "Fallacies of Homœopathy." It is too early for all truth to be known. Once we did not believe in bacteriology, though I believe some one in Germany, back in Hahneman's time, did believe in it.

On May 8, 1897, I was filling a right inferior third molar, mesial and crown cavity with gold. In the right inferior second molar, distal and crown, was a large copper amalgam filling which was put in perhaps fifteen years ago, it looked a good deal worn. I had adjusted the rubber dam and matrix, and my assistant was passing the gold into the cavity, and in doing so would pass the gold cylinders over the amalgam filling in the second molar, accidentally touching the amalgam with the gold. Soon I found that my gold filling rocked, and there was noticeable discoloration of the gold after being condensed. I turned to my assistant and asked, "What have you on your foil-carriers?" She replied, "Nothing." I told her it seemed as if she had either iodine or mercury on the foil-carrier, as the gold was loose and discolored, and that we would have to start over again. The foil-carrier was cleaned thoroughly, and I pro-

ceeded the second time, but soon found that my filling was again rocking; the gold cylinders did not cohere. I took it all out again, and have it here in this bottle and would like you to see it. Afterwards, with a clean pair of foil-carriers, I took cylinders of gold and passed them over the amalgam filling in the second molar, and the gold became literally covered with mercury, as you see it in the bottle. Now, that patient is not very sick, and has never, according to my belief, been injured by that amalgam filling and its free mercury. She is more or less dyspeptic, and I have no doubt a homœopathic physician would consider it an excellent case of direct poisoning from amalgam filling.

I believe this presentation of the subject as given to us by the essayist is the most scientific, most logical, of any we have yet heard, —providing you believe in homœopathy.

Dr. Allen.—May I interrupt the gentleman for a moment? I suppose he intends his remarks to refer equally to the allopathic physician who believes that amalgam fillings are injurious, and there are a great many who do.

Dr. Werner.—I doubt very much the scientific basis on which these objections stand at the present day, whether they come from the allopathic or the homœopathic physician. I do not doubt but that they think they find the symptoms the essayist describes, but are they real or imaginary, and are they due to the presence of mercury in the amalgam fillings? That is the question.

As referred to before this evening, there are many people who cannot afford to have gold, nor can they have their teeth patched up with cement or gutta-percha every six or ten months, and hence they are better served with amalgam fillings. In my practice I use perhaps as little amalgam as any man here, for I believe in gold in distinction from amalgam fillings, and my patients think the same. I might perhaps attack the essayist stronger yet, although I think he sincerely believes what he has told us.

Dr. Taft.—Do not be afraid, doctor; I want to hear whatever you think about this subject.

Dr. Piper.—One point in Dr. Barker's remarks recalled to my mind something that happened a short time ago. A young lady was suffering from some trouble, and the gentleman to whom she was engaged advised her to go to his physician, a prominent practitioner not far from Copley Square. One of the first things he asked her was, "Have you any amalgam fillings in your mouth?" She replied that she thought she had, and he told her to go to Dr. — and have them removed. She asked why she could not go to

her own dentist. "Because," he said, "I am afraid if you should go back to your own dentist, he would tell you that he did not think it was necessary to remove these fillings, and advise you against it." She became indignant, and told him that she had confidence in the ability of her own dentist to take care of her teeth, and declined to go to the other man. She came to me and told me the facts and said, "I want you to go down and talk with him, and find out, if you can, why it is necessary to have those fillings removed." So I made an appointment, and early one morning went down to his office. I talked nearly an hour and a half to this man on the subject, and about all that I could get from him that I could understand was that the trouble was caused by the "dynamic effect." It did not seem to be due to absorption of the mercury into the system. We all know what dynamics are, but what the meaning of the dynamic effect of amalgam fillings in the mouth is I do not know, and I could not get any satisfactory explanation from him. I would like to ask Dr. Taft if he can make it clear to us.

Dr. Eddy.—The only point I would speak upon is in regard to the value of medical opinions. We have two cases in the Rhode Island courts involving this question. In a case of suspected diphtheria the physicians for the patient claimed that there was no diphtheria, while the representative of the State Board of Health said there was diphtheria. Both judgments were given on evidence of the examination of cultures. The house was placarded, and, as a consequence, suit was brought against the board of health for restricting the liberties of the occupants. So I do not know whether we are right or wrong in following physicians' advice in certain cases.

Dr. Briggs.—I am sorry I did not arrive in time to hear the paper. I do not know whether the essayist made this a homœopathic issue or not. If he did, I do not care to discuss it. Or, if he laid down the law that the mercury of amalgam fillings, as a rule, was injurious, I do not think that is a discussable point with the material we have at our disposal. On the other hand, it seems to me that if the question he has brought before us is, "Can amalgam fillings injure a person?" I think that is open to discussion, and I am not prepared to say that they do not. Any one who has had any experience with drugs, foods, or medicines of any sort knows the possibility of meeting with idiosyncrasies which may exist at certain times in some individuals, and at all times in other individuals. We know that there are persons to whom gold would be irritant poison; we know that all the metals are severe poisons in excess of

the therapeutic dose, and that an individual could not be found here and there who would be affected by the different metals that we use I would not attempt to say. But then comes the question, "Why is it that mercury is selected as a scape-goat?" It seems to me from the cases that I have observed, where I have admitted to myself the possibility that amalgam fillings were injuring a person, that the irritation, the possible danger of poisoning, came quite as much from the metals contained in these amalgam fillings as from the mercury. This has led me to feel, in my practice, that a properly made, properly put in amalgam filling was not dangerous; whereas, I have taken out amalgam fillings that looked to me as though they might be dangerous. When you see a filling that is constantly and steadily losing substance, you know that the ingredients are going into the patient, and if it happens to be one of those few patients who are peculiarly susceptible, it may be doing harm. I have taken out such fillings.

I think if this thing is going to be discussed, we must discuss it from all its points and not confine ourselves to the mercury. I have removed most of the copper amalgam fillings that I have put in, but in those cases where I used the high grade alloys, properly mixed, and properly put in, I have yet to see any case where there was any sign of trouble or any cause for their removal.

I remember the case of one patient who had a sore throat and consulted a homœopathic physician, who told her the usual story that nothing could be done until the amalgam fillings were removed. I told her what I thought, but at the same time said I would be very glad to take them out if she wanted to undergo the necessary trouble and expense. I told her that in all the amalgam fillings in her mouth I could see no signs of danger from any except possibly one copper amalgam filling which had lost half its substance, and if she were susceptible to the poison of mercury or to the poison of copper, that was undoubtedly the one which was causing the mischief, and I would be very glad to remove that one and see what the result would be. I did that, and she reported after a while that her throat was very much improved, and later she came to me again and said that she wanted the rest of them removed. I removed them and put in gold fillings, but there was never any further improvement in her case. We must admit, of course, as scientists, the existence of these idiosyncrasies, but if you are going to begin to discard materials because of idiosyncrasies, you must discard your gold and also the phosphates. Fill your teeth with intelligence and judgment, and watch your cases, and if there is

trouble, look to see what the trouble is, and if you have reason to think it is caused by amalgam fillings, remove them, but I do not think it is necessary to go into an absolute condemnation of amalgam. I have not, and I shall not.

Dr. Potter.—We learn from experience that physicians know very little about the teeth and the affections thereof, and hence a prevailing scepticism as to their opinions upon dental matters. When they show us that they have studied the teeth and know them well, I think we will be able to place more confidence in what they have to say about amalgam fillings and rubber plates. I agree with what Dr. Briggs has said as to the possibilities of harmful results from the use of amalgam.

Dr. Barker.—I want to get some information if I can. We want to discuss this question with a view to forming opinions. Will the essayist or will any one tell me on just what ground the belief is based that amalgam fillings are injurious; is it upon the ground that free mercury passes from the filling into the system? As supporting that view is the illustration of Dr. Werner, but with all deference to his statement, it seems to me there must have been some mistake, and there must have been some other cause for his filling "rocking" which he did not understand. Suppose I have an amalgam filling that has been in the mouth for ten years and presents a good, clean, nicely polished surface, how many dentists here present, how many members of this Academy, would hesitate to put gold right into that amalgam filling supposing it to be dry? I would not. My confidence might be misplaced, but I should not have any expectation that free mercury would pass from that amalgam filling into the gold. If my filling "rocked," I would not believe it was because of having absorbed free mercury, but from some other cause. I believe an amalgam filling becomes crystallized, and that no free mercury passes out of that filling either into the stomach of the patient or any where else.

Dr. Taft.—I will answer Dr. Barker's question by asking him another. I do not pretend to *know* or to be able to explain to the satisfaction of every gentleman in this room just what the dynamic influence or action of a drug is. To my mind it is a force of some kind,—an invisible, spirit-like force. Now what is it that constitutes the difference between a live man and a dead one? Is it not the presence or absence of what we call the *vital force*? When a physician is treating a sick man, he finds a condition where the vital force is at a low point, and he attempts to restore it by the use of drugs, or, I should say, by means of their *dynamic*

force. Does he expect that, unless they possess some inherent force, the drugs are going to have the slightest effect upon the material organs or tissues of the body? If that is the case why cannot he successfully treat or resuscitate a dead man with the proper medicines?

In regard to the dynamic influence, therefore, I cannot tell you beyond this what it is, but I would like some one to explain to me why it happens that some persons cannot pass near a bed of poison ivy without becoming badly poisoned. Is there any "free" ivy which gets into the system? If not, is there anything in the force or energy emanating from that poisonous plant that we can see, measure, feel, taste, weigh, or smell?

It has been asked, Is there any free mercury going off from an amalgam filling into a person's system? I am not prepared to say that there is, but I would like to ask any gentleman here who has had occasion to take off a gold band surrounding a tooth that had been filled with amalgam, if, when he removed the cap, he examined that gold band? I have had occasion to do it, and have found the gold band perfectly rotten clear through. I have found that gold caps where they come in close contact with an amalgam filling will present a worm-eaten appearance. But who shall say whether this is due to free mercury, the vapor of mercury, or to some other cause? There are lots of things of which we cannot explain the why or wherefore.

We must reason inductively. We observe certain facts; and from continual observations we come to establish general principles; after these principles are established, we bring them down and apply them to particular cases. Now, in the case of the gentleman who cannot be in a room where there is an uncorked bottle of the bichloride of mercury without developing a severe headache, what is it that causes that headache? Is it free mercury that is going into his system, or is it the *dynamic effect* of the mercury upon that person's vital force? The gentleman does not attribute it to his imagination, because when the bottle is removed the headache, sooner or later, disappears.

How do we explain the cessation of chronic headache after the removal of amalgam fillings? I have seen such headaches entirely cured after I had faithfully taken out every particle of amalgam. Perhaps some member can offer an explanation. I think the Academy has approached and discussed this subject in a very fair-minded way, and with a desire to get at the truth, and I feel that the evening has been a profitable one to us all.

Dr. Eames.—Will Dr. Taft please inform the Academy in regard to the proportion of individuals who are thus affected by mercury.

Dr. Taft.—I do not find that it is a large number. I meant to convey that idea in my paper. I simply wanted to say that I believe a susceptibility to mercury may be established at any time. Mercurial or other abnormal symptoms may appear at any time in a person who has never exhibited them before. That is true of ivy, arsenic, or other harmful influences. We may not be susceptible to-day to the toxic effect of these poisons, but it may happen that to-morrow or next week we will be.

In this connection, I remember a point that I wanted to speak of, a remark made by a chemist who was in my office not long ago. In mixing an amalgam filling, I allowed some of the mercury, in squeezing the mixture, to drop on the carpet, and he asked, "Do you not think that is rather a risky thing to do?" Asking him for the reason why, he replied, "When mercury becomes very finely divided into such a number of minute particles as have fallen on the floor it takes but a moment for the vapor to fill a room like this at the proper temperature, and this vapor is poisonous. Where these globules are gathered together, making one large globule, the volume of vapor would of course be greatly diminished."

Dr. Eames.—I would like to ask Dr. Taft what he believes to be the *modus operandi* of the poisonous action of mercury? Is it a dynamic action?

Dr. Taft.—There is an influence there, whether it is the dynamic influence or not. I do not see why it should not be.

Dr. Eames.—As I understand it, Dr. Taft does not claim that he can explain whether a minute quantity of mercury is absorbed by the system and produces this effect, or whether it is a dynamic action.

Physicians of the homœopathic school are divided on this point; some of them do not believe at all in this dynamic force. I have been endeavoring to get an acquaintance of mine, a homœopathic physician, to come here this evening. He believes sincerely in the theory of the dynamic action of drugs,—that it is the mere presence of mercury which produces untoward effects, and not free mercury getting into the system, but he did not think it wise to come and state his opinions. He said, "At present we are not prepared to show how this is, but we believe that later we can show some scientific reasons why this is so, and give the proportion of cases thus acted upon in the observation of a certain number."

As I understand it, the proportion is acknowledged to be small,

and it does seem unreasonable to abandon the use of amalgam altogether just because of the possibility of danger in rare cases.

The cases of strawberry-poisoning, of which Dr. Taft speaks, are properly termed idiosyncrasies. I know a man who cannot eat a dry cracker without having an area of about an inch square break out into perspiration on his left cheek. A young lady cannot eat eggs without vomiting. A school-teacher cannot take a teaspoonful of honey without his neck swelling to such an extent as to cause great difficulty of breathing, and causing the most distressing symptoms. I have heard of several persons in whom opium produces catharsis instead of constipation. Sometimes nitrous oxide cannot be inhaled, while ether may be taken with impunity. I know of an instance in which ipecac, being compounded in the third story of a house, affected a person on the first story. I know of a lady in this city who sold a horse because she could not ride behind him without being affected with asthma; and a patient of mine has the same trouble with regard to dogs,—he cannot have one without being affected with asthma. In all these cases there is a peculiar condition of the system by which food, drink, or medicines act in a peculiar manner, and those proportionately few cases of idiosyncrasies should not affect our general use of a material or drug which we know to be beneficial in the vast majority of cases.

A word in reference to the action of mercury upon gold. I could not help thinking of the beautiful work which we see in combination fillings as shown us by Dr. Clapp. In some cases the cavity is nearly filled with amalgam, and then gold is packed in to finish the filling, and yet it does not injure it. I agree with Dr. Barker that I should not hesitate to put gold in combination with amalgam where I thought the case would be better served by so doing.

Dr. Taft.—I would like to ask if any one of the members have noticed little holes in gold bands, whether upon a tooth which is filled with amalgam, or in gold caps which are in close proximity to an amalgam filling?

Dr. Briggs.—I was going to speak on that very point, because I took one off last week that I placed on ten years ago, and in that case the tooth was filled with amalgam. The tooth had decayed still more, and I took off the band and placed on a gold crown, but there was no trouble with the band,—it was just as hard as the day it was put on. I might say that I have repaired little places in gold caps with alloy, and in such cases, and, in fact, in all cases, I always like to use a high grade alloy. I do not see anything remarkable in the cases which Dr. Taft has cited where persons have been cured

after the removal of amalgam fillings, but his reasoning is a little specious when he attempts to deduce from them that we should not use amalgam. We know that drugs are volatile; many of them are exceedingly so, and some of them are liable to affect certain persons by their mere presence. This is a fact with the ivy-poison. I know a physician who cannot handle an uncorked bottle of rhus-tox. without getting all the effects of ivy-poisoning, but that simply shows his idiosyncrasy. He uses this drug for his patients whenever it is indicated.

How many of us see cases of ulcerated sore throats? I do not recall more than a very few in twenty years' practice, and in the worst one I ever saw there was not an amalgam filling in the mouth, but there were some abominable gold fillings. I took them out and replaced them with proper gold fillings, and the ulcerations disappeared. It would have been a characteristic mercury mouth if there had been amalgam in the teeth. Another case was that of a very sensitive patient, for whom I had placed in a bridge. She had not permitted me to grind the crowns down as much as I wished to, and she afterwards came to me with a very sore throat. The removal of the bridge and placing her teeth in good order cured the sore throat. On the other hand, I remember the case of a lady who was sent to me to have her amalgam fillings removed, because she constantly suffered from headaches and her physician could not effect a cure. I took out all the fillings and replaced with other materials, and she still suffers with headaches.

Dr. Taft.—I would like to ask Dr. Briggs in how large a percentage of patients of mine who have come to him to have amalgam fillings removed has he noticed this dissolving away of copper amalgam fillings that I had inserted?

Dr. Briggs.—I did not mean to intimate that there were a great number of them, but in the few cases that I have seen, I thought it better to remove them because they had shown this wearing away. It occurred to me that if they were dissolving, the patient ought not to be swallowing copper.

Dr. Taft.—How extensive was the dissolution in those that you did remove?

Dr. Briggs.—I should say all the way from an eighth to a third.

Dr. Taft.—I want to say, Mr. President, that I see a considerable number of my former patients, and if it were not for my convictions with regard to mercury, I should say that I can see not the slightest reason for discarding the use of copper amalgam. The fillings that I put in ten years ago I find to-day to be in abso-

lutely perfect condition, and, furthermore, preserving the teeth perfectly, and I can recall to mind but two cases where I have seen any marked dissolution of copper amalgam fillings that I have inserted. The reason I asked about this dissolution was because I think there are some of our members who were present at a meeting of the Harvard Odontological Society a few years ago, where Dr. Briggs spoke of my having left behind me, upon my removal to Chicago, a great many cases where I had inserted copper amalgam fillings. He is on record as stating (see February, 1894, issue of the *INTERNATIONAL DENTAL JOURNAL*, p. 119) "that it had been his privilege to see some of those fillings, and that he could testify that I seemed to have done some great work in preserving teeth by the methods I had followed."

Dr. Briggs.—I took one out only a month ago that had been gradually disappearing ever since it first came to my notice.

Dr. Taft.—I have never been obliged to remove a copper amalgam filling that I have put in for the reason that it showed this dissolution which so many complain of; but I am continually taking out alloys of tin and silver for the reason that the teeth are so manifestly going to pieces under these fillings. In most mouths, I am free to say, the amalgam fillings are a disgrace to whoever put them in. They show a shrinkage or contraction of the metal about the margin, and on removing the filling you will find the cavity is generally twice as large as it was when the filling was placed in; but I have yet to see a copper amalgam filling that I myself have placed in where there has been any such shrinkage or contraction. They are all as hard as flint. Copper amalgams seem to throw out something like tendrils into the tubuli of the dentine, and in order to remove one you have to cut and scrape until you get down to the very thinnest layer. It adheres like cement to the walls of the cavity,—even more firmly.

Dr. Andrews.—Is it not true that there is more mercury in a copper amalgam than in the other alloys?

Dr. Taft.—Not if you squeeze the mixture very dry to get out all the mercury possible. It takes them about a day to set, when they are placed in as dry as you can get them. If the mixture is inserted in a very plastic condition it will set in about fifteen minutes, and I hope if you decide to use copper amalgam to any extent that you will be sure to remove all the mercury that you can, and you will find that they will then be very much more durable.

Dr. Briggs.—If the essayist would start a crusade against those men who put in amalgam fillings so carelessly, make improper

preparations, and do slovenly work, why, I am hand and glove with him. That is what has cast the odium on amalgam fillings. Many dentists seem to think that when placing in amalgam anything will do in the way of preparing the cavity. I do not see any reason why you should not prepare the tooth as well as you would for gold. I do not say that I always do that myself, but I am doing better every day.

Dr. Maxfield.—There is one thing I would refer to. I dislike very much to have the impression go out from this society, as it may when the proceedings are published, that amalgam fillings are used simply because the patient cannot afford to pay for gold. It seems to me we should use amalgam, gold, gutta-percha, or any other filling, because they are the best things to use in the particular case which we have at hand. I believe, in the majority of cases where we use it, amalgam is better for the patient than a gold filling. I do not believe in subjecting the patient to four or five hours in the chair when I can do practically as much good by inserting an amalgam filling in less than an hour.

In the matter of free mercury, spoken of by Dr. Werner, he has not given us any scientific basis for his belief that the mercury separates itself from the rest of the filling. From a chemical point of view we have reason to believe that there is too strong an affinity between the mercury and the alloy to admit of this taking place. In answer to Dr. Andrews's question, I believe there is more mercury in copper amalgam than there is in other alloys. A great fault with copper amalgam is in its manufacture. I became quite interested in copper amalgam through a paper which was read by Dr. Wegant some ten or twelve years ago, and in my study of the subject I found there was a trick in the manufacture in order to produce the desired result. It is the practice of the manufacturers to express the mercury from the copper amalgam by hydraulic pressure, and after doing this, when offering it for sale, if it was not plastic enough, they simply advised adding more mercury to it.

We know that by hammering an amalgam filling during its insertion it will express the mercury, and undoubtedly the pressure which we use in inserting the filling will cause the minute particles of mercury to penetrate the tubuli, as Dr. Andrews has stated.

I cannot understand what Dr. Briggs refers to when he speaks of the "high grade" alloys. According to Dr. Black's experiments, the best amalgam consists of silver, tin, and copper. Gold is a detriment to amalgam, and is simply put in to bring up the expense, and, being more expensive, many dentists infer that it must be better

to use. It simply shows their ignorance of the necessary qualities of an amalgam.

I may say a little in the way of criticism of the essay. The writer has not given us any proof that the ill effect which he describes can be positively traced to mercury. We get the same effects from the poison of other metals; we get it from lead; we get it from copper. We know that mercury is often adulterated with lead, and in view of all this, in cases where there is an idiosyncrasy, the poisoning could result from copper and lead as well as from mercury, and we have not yet heard any evidence that such is not the case. Now, I have had a number of these symptoms that Dr. Taft has spoken of resulting from other causes to which I could trace them. I have seen these inflamed throats and mouths in cases where the patient was suffering from stomach trouble; seen them in mouths where there were no amalgam fillings whatever. I have one patient who presents these symptoms occasionally, and the use of trichloroacetic acid cures it at once.

Dr. Smith.—My excuse for speaking again is because I wish to correct a statement of the last speaker that we did not want to have it go out from this Academy that we used amalgam on account of its cheapness. This Academy desires the facts to go forth, and I repeat that it is a very important fact, which we wish every one to know, that if the bill now pending before the Legislature, or soon to be brought before it, should pass, it would work a hardship to poor people, and we are willing to admit that in many cases we do use amalgam fillings on account of the expense to the patient. To cite a case: Suppose we have a patient whom we know to be very, very poor, and we have a large buccal cavity to fill for that patient. The patient cannot afford to pay for the time which it will require to put in a gold filling, and there are only two things to do,—fill the cavity entirely with cement, or entirely with amalgam. Now, there is no doubt that if the patient was to be deprived of the benefits of amalgam in that case, it would be a hardship, and we know that there are many, many such cases.

WILLIAM H. POTTER, D.M.D.,

Editor American Academy of Dental Science.

ACADEMY OF STOMATOLOGY.

A REGULAR meeting of the Academy of Stomatology, of Philadelphia, was held January 25, 1898, Dr. Edwin T. Darby in the chair.

A paper on "The Preparation of the Mouth for an Artificial Denture preparatory to taking an Impression" was read by Professor Robert H. Nones.

(For Professor Nones's paper, see page 270.)

DISCUSSION.

Dr. H. B. Hickman.—I should like to know what Dr. Nones would use for cleaning the rubber attachment plate; would he still use sulphuric acid, or would he use the potassium solution? He suggests the cleaning of metal plates with sulphuric acid.

Dr. James Truman.—The paper is interesting, especially in that part of it where Dr. Nones says we must submit ourselves to circumstances. The iron-clad rule which has so long prevailed with dentists of extracting all teeth is, I think, wrong. If two or three teeth are in the mouth, they will remove these without taking into consideration the health of the patient or the conditions that may supervene. In my opinion the extraction of teeth and even the extraction of roots for the purpose of insertion of artificial dentures has been carried too far. We do not take into consideration sufficiently that these roots are of great value in mastication. Take, for instance, a case where we have two laterals in the mouth with the central roots between. Now, most dentists would take them out. I would advise their proper treatment and retention as the roots furnish a base for mastication which the gum cannot.

During the past winter I instructed a student to make a denture over just such a case as I have cited. He was astonished, and could hardly persuade himself to make the set, and asked the opinion of several others. Their judgment was that the roots should all come out. What were the conditions? Here was an elderly woman, very feeble and unable to bear the extraction of the roots. Taking these facts into consideration, I ordered the plate made, which was done after treating the roots.

The idea of extracting teeth is too common. We must treat our patients as we find them; not as we would like to have them. It is much easier to make a denture where all teeth are extracted; but there are many cases where they are very valuable for clasp-

ing; and in the lower jaw, especially, it becomes of vital importance that they be preserved to give stability to the artificial teeth.

I am glad that this question has been brought up. In former years it was taught that the mouth must be freed entirely of roots. I do not believe that now. I do hold that the European idea of keeping all the roots in is a very bad one, especially considering the state in which they generally keep them. We must make everything healthy before the impression is taken, or subsequently. It is very difficult to keep the roots in a healthy condition after the plate is inserted, but by the use of proper antiseptics they may be kept in a condition sufficiently satisfactory to warrant retention.

With regard to the production of irritation and inflammation by plates, several years ago Dr. Black demonstrated that vulcanite plates are very fine culture-fields for micro-organisms, and that these really produce the irritation. You know that in former years dentists supposed that it was attributable to the vermilion in the vulcanite. A committee was appointed many years ago to examine into this, and demonstrated quite conclusively that there was no free mercury upon the surface and that the irritation could not be due to that. The idea that it was the non conducting property of the rubber that produced it was then very general. I question that very much, although, perhaps, it has something to do with it, but it can only be tested by the determination of the increase of temperature between the plate and the mucous membrane. It is probably altogether owing to the development of micro-organisms upon the surface of the vulcanite plates, because these are almost invariably rough. If they were polished upon their contact surfaces I doubt very much if there would be any difficulty. If the patients were directed to use a powerful antiseptic there would probably be no trouble from inflamed gums.

The plate should be taken out and placed in an antiseptic wash over night, and there is nothing better for this than hydronaphtol solution. Why porcelain plates are not affected in the same way as rubber plates I cannot understand, because they are not very well polished; and the roughness here should make a good place for the development of micro-organisms.

Dr. Hickman.—When I first began to practise, I thought it was against all rules to make a denture over roots. In fact, I thought I had been taught that. One of my first patients wanted me to make a plate over at least eight or nine roots. She had been wearing a denture, and I told her I would not do it. I lost my patient by refusing to do so. In about two months she died of tubercu-

losis. I have thought that by giving my experience my conscience would be easier. I feel that if I had done as Dr. Nones advises I should feel much better about it.

I would like to know if the use of thin tin-foil over the model, as we are now doing at the University, would not entirely do away with the pin-point roughness.

Dr. I. N. Broomell.—I have always looked upon vulcanite as irritating, partly because it so accurately fits the parts. If we compare the surface of a vulcanite plate with that of a gold or other metal plate, particularly under a microscope, we will find that the latter is absolutely smooth, while the former is rough. As Dr. Nones has said, these invisible pin-points are, no doubt, the source of irritation. Not only these pin-points to which he has referred, but also the sharp lines produce irritation. These, of course, can be polished, and I instruct my students to polish the plate sufficiently to remove all fine prominences.

I would ask Dr. Nones one question. He referred to the surgical treatment of double lip. I would like to know the surgical treatment.

Dr. H. E. Roberts.—While fitting a vulcanite plate to the mouth the patient almost invariably asks, "Shall I wear this all the time and wear it at night?" My own advice to the patient is, "Leave your plate out at night if you can possibly do so. If it makes your jaws ache so that you cannot get along without it, then wear it; otherwise leave it out as much as possible." The mucous membrane beneath a vulcanite plate becomes inflamed. The plate fitting as accurately as it does acts like a bandage on any other part of the body. The skin becomes tender and soft under the bandage, and the mucous membrane under the plate gets into the same condition.

Dr. Nones made no reference in his paper to the subsequent care of the mouth,—that is, to keeping it clean and in a healthy condition. I think that the removal of the plate at night is a very important means to this end.

Dr. Huey.—Will Dr. Roberts explain whether he finds as much irritation from the metal plates as he does from the vulcanite.

Dr. Roberts.—I never find as much irritation under a metal plate as I do under a vulcanite one. Under the latter the mucous membrane becomes hot, because it fits so accurately, while with a metal plate relief is obtained through the air-spaces. Every surface should have a rest. I think the keeping in of the plate at night is about the same as wearing shoes in bed.

Dr. Coney.—There is one plate that will not cause the mucous membrane to become inflamed. That is the porcelain, and it is the only plate that is absolutely cleanly in the mouth. I do not think a vulcanite plate can be made to fit tighter, but I have seen gums very much inflamed by vulcanite, but not by porcelain. I have taken out vulcanite plates and also metal ones and found inflammation present. I have put in porcelain plates and afterwards the mouths became hard and healthy. I had a case of that kind in Princeton some seventeen years ago, where vulcanite plates had been worn for a number of years. After the patient had worn one for a year the tissues became so soft that he could not keep his plate up and had to remove it every night. I made a porcelain plate for him, which he wore for about six weeks. I reground it, and he wore it for six months. I then made another one which he wore a year. Then I made him another, and that was the last, and I believe he wore it up to the time of his death, which occurred some years afterwards. I have seen porcelain plates that have been worn for twenty-five or thirty years, but I have never seen irritation produced by them. Why should it be necessary to take the plate out at night? Would it not be better for the patient to keep the plate in the mouth for rest?

Dr. M. J. Schamberg.—We have heard numerous explanations of the cause of inflammation from artificial dentures, and in trying to sum up I have come to the conclusion that each statement is very plausible, and that, therefore, we ought to classify. I think we can with justice say that the cause of the inflammation of the mucous membrane is not alone the non-conductivity of the plate. We ought to take into consideration all of the conditions that may exist. In the first place, we know that a loosely-fitted plate is very likely to produce irritation; that we have ulcers due to putrefactive changes which are accountable to the food which collects on the plate; then we may have a plate which fits entirely too tightly. If you place in an artificial denture which causes continual and excessive pressure, you are bound to have inflammation of the underlying parts. A patient should remove a plate at night for the same reason that he should take off his rubber shoes upon coming within doors. If rubber shoes are worn continuously they cause the feet to become tender and inflamed. A vulcanite plate acts in practically the same manner.

Dr. H. C. Register.—Dr. Nones is an expert, and has given us this evening a practical paper. I think, however, that the discussion is digressing from the subject of his paper, which, if I under-

stand correctly, is the preparation of the mouth for artificial dentures. If any man knows how to do that, I think Dr. Nones does, yet there were one or two points which he seems to have omitted which have been of great moment to me. The impression upon which we are going to form the future denture is an essential to success, and the subcutaneous tissue must be considered in order to obtain usefulness of a denture. I think that most operators believe that plaster of Paris always gives the best results. We get a fac-simile of the mouth upon which to form the denture, and from this make a negative which must be a success. In some cases the tissue is of such a character that it must act differently with the plate in the mouth from what it does with the plate out of the mouth. In other words, we have a soft condition of the mucous membrane, physically healthy and yet springy. I have found in these cases that it was absolutely impossible to get a perfectly satisfactory denture made from an impression taken in plaster of Paris, while with the modelling compound, particularly the hard variety, these cases would be invariably successful. I merely call attention to that. It is a little point, yet a great one for comfort to the patient.

Another point to which Dr. Nones called our attention is the retention of as many teeth as can be made useful either for mastication or for retention of the plate. Since I have grown old I have retained one bicuspid upon which I do a great deal of work, and I never appreciated until recently how much work could be done by one or two natural teeth in the mouth. I think that every operator in preparing the mouth should be extremely careful to preserve all teeth that can be made useful. A great many of these teeth and roots, and roots that cannot be crowned, can be made healthy with a very little treatment. As a mouth-wash, one of the best things that I know of is sea-salt in solution. Dissolve a pinch of it in a little water and wash out the throat and nares. There is nothing more stimulating to mucous membrane or destructive of germ-life. There are many persons wearing artificial teeth who do not appreciate how filthy the mouth can become.

Many years ago I inserted an obturator covered with a gold plate. The patient went away, and I do not think that I saw him again for six or eight years, when he informed me that the plate had never been removed during that time. He said he was afraid he would never be able to get it in again.

Dr. M. H. Cryer.—The condition referred to as double lip is not exactly double lip, but a fold of mucous membrane lapping

over a badly fitting plate, or one that has been kept in. The irritation starts upon the upper edge of the membrane and folds over and over. I have seen the growth in some cases protruding below the true lip. I had a marked case while Dr. Nones was a student at the Philadelphia Dental College. It was dissected away with a scalpel, and a few stitches, perhaps four on each side, put in to bring the mucous membrane of the lip into apposition with the membrane covering the alveolar process. The operation was successful and the patient recovered quickly. In some cases, where not very marked, it can be treated with an alum solution or some other astringent.

With regard to the removal of teeth and roots. I was taught to remove all roots that a plate would cover. I believe it is the general practice and a good one, but there may be exceptions. The great objection to allowing a root to remain is that the plate rests upon it, the gum grows over the edge, and becomes irritated and hypertrophied. In my teaching I recommend, as a rule, the extraction of roots which will lie beneath the plate; but in exceptional cases, if a root can be kept in a perfectly healthy condition, I would let it remain.

I believe that it is better to remove a plate at night, for that gives the tissues a perfect rest, and the parts are then ready the next day to sustain the plate in position. If a plate is constantly kept in the mouth the vacuum-chamber is filled with the mucous membrane and the plate does really no good. The large majority of mechanical dentists use a larger vacuum-chamber in each succeeding plate until, as a result, the mouth may not only be level from side to side, but the centre of the mouth on a level with the alveolar process. I think that by keeping the plate out of the mouth at night the parts will be induced to return to their normal condition, and the deformity in the centre of the mouth will not be produced.

Dr. Nones.—In answer to Dr. Hickman's question, I would say that I simply clean the rubber attachment plate with pumice and not with acid.

With reference to the use of tin-foil to avoid roughness of the vulcanite, you will remember that I said it could be done by the use of tin dies, but even then some spots will be found on a vulcanite plate.

As to the double lip, Dr. Cryer answered that question. It is not a scientific name, but it is an easy one for me. I have seen many cases of that kind, but very few as marked as the one of

which Dr. Cryer spoke. I saw the operation upon that one. The beginning of this condition may frequently be observed in cases of tightly fitting vulcanite plates.

I fully agree with Dr. Roberts in his position, and always tell my patients to remove their dentures at night, believing that if the advice is not satisfactory to them they will do as they please, while for my part I feel that I can do no harm by telling them to remove the plate. In most cases more harm than good is done by leaving it in.

I hardly think that irritation is caused by a tight fit, but, as Dr. Truman remarked, the vulcanite plate seems to be a favorable locality for micro-organisms, the germs thrive beneath it. I have seen both tightly fitting and very loosely fitting plates produce this condition.

Replying to Dr. Coney's question, I may say that I have seen porcelain plates also produce irritation, but not in many cases, for one does not see many porcelain plates. I think it is not nearly so likely to happen under porcelain as under vulcanite, and it may be explained that germs do not thrive upon a porcelain plate. Nature seems to be friendly to porcelain. You may make a porcelain crown and poorly fit it to the root, and the gum will adapt itself to it and really not be irritating, while again you may fit a metal crown in the same way and have the same gum irritated.

My paper being upon the preparation of the mouth alone, I made no reference to the preparation of the plate nor to the taking of impressions in soft, flabby conditions.

Adjourned.

OTTO E. INGLIS,
Editor Academy of Stomatology.

ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

THE stated meeting of the Odontological Society of Pennsylvania was held December 11, 1897, at 1415 Walnut Street, Philadelphia, President Brubaker in the chair. After the routine business was finished the following remarks and discussion on dental caries took place.

REMARKS BY DR. C. N. PEIRCE.

MR. PRESIDENT AND LADIES AND GENTLEMEN,—We all recognize that the ideas of the present day have been evolved from the past,

and, therefore, I thought it might not be amiss to run hastily over the various facts in the experience of the last century and a half regarding the causes of dental caries.

Those of you who are familiar with the facts remember that Bourdet and Jourdain, in 1754-56, published a paper stating that caries was due to an inflammatory condition of the dentine, and that it was analogous to inflammation of the soft tissues. They believed it arose from want of nutrition.

It is most singular that we have no paper on this subject of any importance from that date until 1835 or 1840. Then Dr. Robertson, of Burlington, announced that dental decay was due to a chemical agent. He stated that he found acids in the mouth, and that when teeth are subject to acids they become devitalized. He published an essay stating that dental decay was due to acid secretions. But he had no knowledge of how the animal matter was disorganized or decomposed.

Following him Dr. George Watt, of Ohio, stated that white decay was due to nitric acid, and that dark decay was due to sulphuric acid, and that where the decay was of different colors it was due to hydrochloric acid; but though he was professor of dentistry in an Ohio college, his assertions made no impression on the profession.

Nothing further was advanced until we had the views of Magitot, who reiterated the views advanced by Robertson, but he made no definite statement as to how dental decay progressed, other than that it was due to acid in the mouth, and gave no explanation of the decomposition of the organic matter of the tooth.

Following Magitot, Desirabode published a short paper in which he stated that decay commenced in the pulp-chamber from the want of nutrition in the dentine, and through a vital action it worked from the pulp-chamber towards the periphery of the tooth. But facts were not consistent with the statement, and it made little or no impression on the profession, the large majority believing that decay was due to chemical action.

Following Desirabode, came John Tomes, the father of our present Charles Tomes, who gave himself to microscopy and dental physiology. He stated that decay was evidently due to a chemical action, and that the acids in the mouth were responsible for it. Still there was no explanation of the decomposition of the organic matter in the tooth.

Following John Tomes, Bridgman, of England, said decay was due to a chemico-electrical action. He took the ground that the

tooth was made subject to the influence of acids by having its electrical condition disturbed.

He was sustained by S. B. Palmer, of Syracuse, who holds the ground to-day that the electrical condition of the teeth is responsible for decay. He has written several interesting papers in which he says that it is impossible to estimate how far this condition changes the character of the dentine; and he maintains that it is an abnormal condition that makes the teeth yield to the influence of the acids in the mouth.

This was the condition when Dr. Miller took hold of the subject. Dr. Miller made an examination of the secretions of the mouth, and isolated twenty-two micro-organisms. He found that sixteen of these organisms produced an acid that he believed was instrumental in causing decay. But he was not satisfied that it was the sole cause. He placed teeth in a vessel and inoculated them with these micro-organisms and produced artificial decay, not only of the lime but of the albumen. And so to Dr. Miller we are indebted for our present theory of decay in teeth,—parasitico-chemical,—because produced by micro-organisms and the acid introduced by their multiplication.

This is the theory that we accept to-day, and I believe it is a correct theory, so far as we have any knowledge of caries or decay in the mouth. He said of these twenty-two micro-organisms, sixteen of them would produce either lactic acid or acetic acid, and those two acids, he thinks, are largely instrumental in decalcification.

He named five of the organisms that are found in progressing decay, and from his experiments he has no hesitation in stating that these organisms are instrumental not only in producing the acid and decalcification of the teeth, but also in disorganizing and putrefaction of the organic matter of teeth. And that is the way the case stands at present in regard to decay of the teeth.

Now, a few words in regard to the progress of decay. I think we all accept the statement that decay must commence externally. There must be some opening, so that the secretions of the mouth come in contact with the dentine, before the dentine can become disorganized. Whether enamel is always decalcified, or whether we have organic matter between the enamel fibres disintegrated or loosened, is a fact that we must decide for ourselves in every case. I think every observing dentist will have noticed many cases, especially after typhoid, where an examination under the microscope will show the enamel fibres undecalcified, and the organic matter between these fibres disintegrated.

Now, has this disintegration of the organic material taken place through the action of the acids or through the action of micro-organisms? I do not mean to be understood that all abrasions of the enamel are so produced. We have many cases where the dentine is reached by the decalcification of the enamel fibres. But I also believe that we have a great many where the enamel rods are not decalcified, but the disintegration solely effects the matter between the rods.

I had hoped my friend, Dr. Allan, would be here. He does not believe enamel possesses any vitality. He says, "How can you believe that enamel is not dead the moment it is formed?" His view is endorsed by Dr. Williams, Dr. Andrews, and Dr. Black that formed enamel is dead enamel. I believe that formed enamel is not necessarily dead. I have had evidence that the enamel of a tooth may change in structure and also in its color. And if vital changes take place in any tissue, certainly that tissue is not dead. Chemical changes may take place, but vital changes do not take place in dead matter. I therefore agree with Dr. Truman that formed enamel is not necessarily dead.

(Dr. Peirce then exhibited and explained lantern slides by Gysi.)

Before I close I should like to report the result of a little experiment that may be of some importance. It has long been a question whether a cotton filling would arrest the progress of decay. Now, I placed in these two test-tubes a solution of grape-sugar, and then a plug of cotton in each down to within two inches of the bottom, and inoculated the upper part of the solution with the fungus. You will see that the upper part has fermented, while the lower part is clear. You know some claim that the cotton used for filling should not be absorbent cotton. In one of these vessels there is ordinary cotton, and in the other absorbent cotton, and in each case the cotton equally acts as a bar to bacteria. On one or two occasions patients go home with only cotton in the cavity, and decay has been completely arrested. Of course, the cavity was previously sterilized.

A Member.—Without sandarac?

Dr. Peirce.—No, the cavity should be first sterilized, then the cotton with sandarac should be placed in.

Dr. Darby.—I thought perhaps something was going to be said about some of the systemic conditions and the environments which might possibly change teeth for the better or for the worse.

Dr. Black says that all teeth are equally soft; that the dentine of all teeth is the same in density; that they have the same spe-

cific gravity; that a good tooth is no better than a bad tooth; that any filling-material that will save one tooth will save any other; and that there is no choice except on the part of the dentist between lead or tin or gold or amalgam. Well, now, I do not believe that bad teeth are always bad. I do not believe that teeth that are bad in the beginning are bad all through life. I am honest in being mistaken, if I am mistaken, but I believe I have seen changes in the teeth of some of my patients. I call to mind a patient who for ten years suffered from caries of the teeth. He was then leading a sedentary life. He changed his occupation, becoming a railroad man, thus securing plenty of air and exercise. His teeth before required constant care. Now he will go sometimes for five or more years without a single cavity in his teeth. He is an unprofitable patient, because his teeth do not require any care. Dr. Black would say that they could not change for the better.

I have a young lady coming to me who first visited me four years ago. At that time she entered college with as good or better teeth than the average. I saw her the other day. She graduated in June. She had worked hard. Her teeth are a perfect wreck. A breakdown from mental strain has caused that wasting away. You may say that is due to a changed condition of the secretions of the mouth. That may be, but does not the vital condition have something to do with it. There are some things we cannot measure with the yard-stick. There are certain things we cannot demonstrate with crucible or test-tube. We say we think it is acid; we think it is bacteria; that vital force has nothing whatever to do with it. But I believe that old John Tomes was right when he said that decay was chemico-vital. Dr. Black can weigh dentine. He can tell us just how much of the various salts are in it, but that cannot determine the quality of that dentine. I understand that his experiments were made with wet dentine, not dry. He does not tell us about enamel. We all know there is a difference in the density of the enamel. I believe that enamel is living; if not, I do not know how it could change its color and its hardness, and I believe the enamel changes its hardness as well as the dentine. I have no doubt Dr. Black has made the most careful, painstaking experiments. I have the profoundest respect for a man who can go through the experiments and theories that he promulgates, but I do not believe in them. Still, I may be wrong and he may be right.

Dr. Libby.—I wish to say a few words in regard to what Dr. Darby has referred to,—vital force. While I have always believed

in the germ theory of caries, I still maintain that vital force has much to do with it. I cannot understand how any one in the practice of dentistry for ten or twenty years can come to any other conclusion.

It undoubtedly does occur. I have often seen cases of cavities which have progressed for some time, and afterwards decay has ceased and the surface of that cavity has become brightly polished. Decay has been arrested. There has been a change in the systemic condition. The causes have been arrested by some natural operation. The caries has been arrested. How? By a change of the environment. By a change of the habits of the patient. Perhaps that patient, as Dr. Darby has just related here, has been doing a great deal of brain work. They have taken a rest from that work, from change of life, and the vital force has had a chance to repair the damage done prior to that. This, to me, is one strong argument in Dr. Darby's contention that vital forces have great influence.

Dr. Peirce.—Some one in Pittsburg sent me a patient who was a glass-blower. Two years ago he was elected head of the union. When he first came his teeth were just commencing to decay. But he is now in a state of nervous excitement from brain-work. I have the greatest trouble to protect his teeth. I believe it is entirely due to a systemic condition arising from irritability of the nervous system.

Dr. Libby.—A gentleman came to me with a loose superior bicuspid, a pronounced case of pyorrhœa alveolaris. All treatment failed and the tooth was finally extracted. A few months afterwards he came back to me with the bicuspid on the other side similarly affected. After two or three treatments the patient left me. After some months I saw him again, and was surprised to find the tooth firm and in a healthy condition. "What have you done?" I asked. "I concluded," he replied, "that you did all that you could with the other tooth, and that if I continued on with you I should have the same experience as with the first, so I bought a bottle of Hood's sarsaparilla, and this is the condition of the tooth as a result."

Dr. Kratzer.—Mr. President and ladies and gentlemen, as you perhaps all know, my presence here to-night is partly accidental. I was not aware, until I learned that by a lapse of memory I had missed my train and had to lay over, that I should be here to-night. This is at all times a very interesting subject, and interests us as dentists as well as patients, and I think that when we can arrive at the true theory of decay and direct our investigations or the inves-

tigations of the scientists in our profession towards the means of combating the cause by applying the antidote to the cause, we will have conferred a blessing upon humanity as well as upon our profession. I would like to mention an instance of arrest of decay without dental interference. I had occasion to extract a tooth which had become loosened by calcareous deposit, and after its extraction I found that there was a small speck resembling a filling. I examined it closely and determined in my own mind that the tooth had been filled with cement. But as the patient disclaimed ever having had a tooth filled, a closer examination compelled me to come to the conclusion that the cavity had been thoroughly filled by tartar. On drilling out the cavity this proved to be the case.

Dr. Jefferis.—I believe that there is some vital matter in the enamel, but so extremely small a percentage that it hardly has any weight in determining the life of the teeth in sickness or health. We do know the teeth will undergo changes physically. We know of teeth filled with gold where the fillings after ten or fifteen years will stand out from the teeth, showing that the tooth-substance has disappeared, and yet the margins will be perfectly sound around them. There has been a lessening of the diameter or the circumference of the tooth itself beneath the surface. But as to a vital change taking place in the teeth, I do not believe it.

I must accept the theory that acids and micro-organisms cause decay. I believe such changes are systemic. It may be due to the acids of the mouth, but these arise from general conditions of the blood manifested locally. The human anatomy is wonderfully complex. The saliva takes its part, and the teeth are constantly bathed in it. There are certain diseases, as of the kidneys, for instance, where the uric acid that should be eliminated is confined to the blood. We cannot go over all that ground and prove our points, but we can have our theories and believe them.

And in regard to this question of arrestation of decay without the interference of the dentist, it can be and has been done. I have seen several such cases as our friend Dr. Kratzer has mentioned, but they are not frequent. The cavity is perfectly filled and decay entirely arrested by the deposit of calcareous substance. But I hold that the improvement is due to systemic changes and not to local changes in the mouth. Nor do I believe that the changing of the tooth-structure had anything to do with the restoration.

Dr. Roberts.—It seems to me clinical observation and clinical experience would warrant any one in accepting the conclusion that

changes take place in the teeth. They become more dense and the enamel changes color. I cannot see how Dr. Black can arrive at the conclusion that a tooth once bad is bad always. If he has had the clinical experience of a man that has been in practice any length of time he would have drawn different conclusions from his scientific observations.

Dr. Head.—Systemic treatment has not been dwelt upon as much as it deserves. The regulation of the teeth and preservation of the interdental spaces are also important factors. I had a case in my practice of a little girl, nine or ten years old, where the most alarming state of the teeth was present. It seemed hopeless that she should escape a severe course of tooth-regulation. She was frail and anæmic, and I concluded to prepare for the inevitable by building up the system. I gave her beef extract, syrup of hypophosphites, insisted that the child should take plenty of exercise out of doors, and, above all, I directed to be rubbed into the child, morning and evening, large quantities of cod-liver oil. To my surprise in three to six months the teeth seemed to move like magic, the jaws spread out, and in the course of a year and a half all danger of tooth-regulation passed away. Of course, nature might have come to the rescue without the treatment, but it seems to me that the treatment in this case was partly responsible for the change.

Dr. Bonwill.—I would propose to the dentists here, or in this city, or in the wide world, who are talking on the subject and who wish to be understood as knowing how to preserve teeth from dental caries, that they should do as Dr. Black states is the method to adopt to reach something definite and upon which we can depend in the future.

Dr. Gilbert.—If Professor Black is right, I cannot see how it is that for the past eighteen years I have been deceiving myself in reference to the changes in teeth. I do not see how any man with any practice at all can conceive such an idea, because teeth certainly do change, or else my observations have been very wrong.

And the other statement that it makes no difference what filling you use. Why, I think it makes all the difference what kind of filling is used in the teeth. Certain kinds of teeth are better preserved by combinations of filling than where a single kind of filling is adopted. It is surprising to me that Dr. Black will make such a statement.

Dr. Peirce.—I would like just to say one word. This card is a representation of sections of the enamel. The lower left hand corner will show very definitely the claims that are made. It is,

as Dr. Gysi says, a transverse section of the fibres, and it gives one a very clear and definite idea of the intervening spaces, showing that certainly if you magnify the enamel fibres you do get a definite idea of the material between these fibres, and showing that the material between the fibres is organic matter.

Adjourned.

JOSEPH HEAD,
Editor Odontological Society of Pennsylvania.

Editorial.

THE FUTURE ENTRANCE STANDARD.

THE period is approaching when the question of entrance standard to our dental colleges must seriously be considered by the National Association of Dental Faculties; and while it is not the purpose of this article to forestall opinion or to influence minds, doubtless confirmed in the views entertained by the majority at the last meeting of that body, it is necessary that the thought of dental educators should be turned in this direction that they may be prepared to act intelligently when gathered together at Omaha.

The Association of Faculties was subjected to severe criticism for its action at Old Point Comfort by a certain class, whose knowledge of educational matters has been limited to their connection with boards of examiners. Unfortunately the mass of the dental profession take the verdict of these men as representing the highest intelligent opinion upon the subject, and treat the action of the faculties and the reasons given for this with undisguised contempt.

The decision of that association has passed into history, and there is no disposition to traverse that further than to repeat in substance the statement of the editorial in the October number of this journal, that the Association of Faculties did the only thing possible under the circumstances and, for the time, adopted the right course of action.

The growth of communities in intelligence and prosperity cannot be accomplished by forceful measures, but must be left to the slow evolutionary advances of time. This is so much of a truism

that it remains a matter of constant astonishment that men seem to fail to recognize it as a law of the universe. As well attempt to make a mature human being of an infant as to force society, institutions, or peoples to an advanced stage of intellectual growth by process of law. This fact being recognized, it becomes our duty to plan the development of our profession upon principles in harmony with it, and avoid the unpleasant experience, so frequently witnessed, of being obliged to retrace the steps taken, a result to be deplored, as it retards the accomplishment of the object sought to be attained.

The arguments brought forward to sustain a forced advance are based mainly on two propositions: first, that a better element is needed in dentistry; and, second, that the dental profession is overcrowded and means must be instituted to lessen the increasing numbers.

The first proposition is conceded. In all callings the demand is for greater intelligence, a demand never satisfied, and which probably will never be so long as mentality is working upward towards the greatest possible attainment,—the goal of perfection. This aim simply represents the evolutionary force which has brought about the product which we call civilization, and which must continue to be exerted as long as the race continues to exist.

The second proposition, that the dental profession is overcrowded, would mean simply a reiteration of statements based on statistics. Taking this view, it possibly is overcrowded, if the number in practice be compared with population, and yet even here there is a very respectable clientage for every man and woman engaged in the practice of dentistry. It is forgotten, it is presumed, that the colleges are not only educating these to practise, but they are at the same time educating the masses to a correct appreciation of dentistry as a means of prolonging life and deliverance from suffering. This education of the people is rapidly developing beyond the bounds of mere luxury to that of an urgent necessity. Every year, therefore, adds to the demand for skilled laborers in the field, and this must continue as intelligence increases.

Having conceded the importance of a higher standard for entrance to the dental profession, it becomes essential that the further question must be considered. How far can this go without injury to the practical side of dentistry? It has been recognized by all writers upon dental work that the foundation of this calling was built in this country by men whose attainments were largely mechanical. It is further recognized that had it been placed in the

hands of graduates of literary colleges with the medical degree superadded, it would have proved in practical excellence a decided failure. It is unnecessary to refer here to instances of this in its history. Dentistry has been in the past strictly a mechanical calling with a thin veneer of culture added. It has been the aim of later years to reduce the former and increase the latter; until the veneering has been transferred to the preliminary education, and the presumably solid theoretical training placed in the closing years. This means, as it seems to the writer, a deterioration in the not far-distant future in all that appertains to good work.

It is difficult to draw a correct dividing line between mechanical training, on the one hand, and culture, on the other, both being essential to ultimate success; but, if one is to be sacrificed, it would seem to be better to give more time to the former than to the latter, as this will ordinarily result in the greatest benefit to the patient and operator.

It is just here that the increase in the standard for entrance to our dental colleges must be considered. If we are to train men to practical excellence, and this is certainly the paramount object, and at the same time give character to our calling, there must be a reasonable division made between practice and culture. Extremes in either direction will result in incalculable damage to dentistry, and may retard its healthy growth through generations. Every step taken must therefore be weighed in the interest of all concerned.

The Association of Faculties very wisely hesitated to change the existing order until time had been given for calm reflection. This time has now arrived, and it is for this body at its next meeting to consider and to act.

The conditions existing in the United States are not those of older countries, and any action that fails to take these into consideration will result in serious failure. Aside from these, we are brought face to face with a practical difficulty that, in the view of the writer, is of vital importance. It has been proposed in some quarters that a standard equivalent to a diploma from a high school should be required for entrance to dental colleges. This has been insisted upon as a requirement by at least one State board. This must be regarded as a very high standard. If universally adopted, it would entirely debar a very worthy class of young men hampered by limited means from ever being able to practise in its ranks. To this the selfish side of dentistry would answer, "This is exactly what we desire." The better and altruistic side would

reply, "As dentistry has grown in the past through the efforts of this class, can it justly deprive it of its rightful inheritance, and would it not in the end insure its own destruction?"

The college side of the question can take care of itself. It is not of so much importance that all of these institutions should be sustained, while the adoption of any standard which would result in the destruction of those at present established upon a good working basis would be regarded as a calamity.

The question of greatest importance seems to pivot round the idea, "Is it possible to advance the standard to that named and now in force in several dental institutions? What are the conditions?" The average age of entrance to a high school is, it is assumed, about sixteen years. The diploma cannot be earned in the best institutions short of three years, and generally four. This brings the proposed student to twenty. His mind is stored with a large amount of digested and undigested knowledge, but his fingers are, as a rule, utterly untrained in the proper movement of anything, not even the pen, if we may judge by the writing of many of them. It is a recognized fact in all trades that a man cannot acquire these unless he starts not later than sixteen, and no employer would undertake to train a person in mechanical dexterity at twenty or twenty-one. While there are exceptions to this, these will be found possessing that natural bent that leads some to mechanics in spite of their surroundings, but these need not be considered in this inquiry. It has been the observation of all teachers placed in close touch with dental students that those who enter at the advanced age mentioned are slow to acquire mechanical dexterity, and the majority fail to excell. In proportion as years go by this ability to acquire is decreased. So true is this that the conscientious dean will discourage the man of thirty-five from attempting it, unless he be fortified by previous practice in other lines of mechanical work.

While this statement has been antagonized in certain quarters it remains with the writer a fact of observation, and should be considered in any attempt to advance the standard.

If, then, this be admitted, an effort should be made to regulate the standard to bring the proposed matriculation not later than eighteen years and not higher than is possible of attainment by any energetic person in or out of the high school. Changes in the standard must recognize the possibilities of being able to work up to it by those outside of such schools. The effort to reach the standard of a high-school diploma would be beyond the possi-

bility of any except the most determined and free from pecuniary embarrassments.

What, then, should be the course of action in the Association of Faculties? To the reasonable thinking mind this should not at present go beyond the first year of a high school. Let this be the standard now, and it can be left for time to solve the problem of a still further advance. The experiment is now being tried by the departments of several of the universities and one or two isolated schools. This is as it should be, and no criticism can be made against this action. A few years will demonstrate the effect upon those adopting this high standard; but, whether for good or ill to these, their action should not be taken as the standard for the entire educational body. This would, beyond all question, be disastrous to dentistry, to the colleges, and, in a broader sense, to the humanitarian aims of the dental profession.

Bibliography.

ANNUAL AND ANALYTICAL CYCLOPÆDIA OF PRACTICAL MEDICINE.

By Charles E. de M. Sajous, M.D., and one hundred Associate Editors, assisted by Corresponding Editors, Collaborators, and Correspondents. Illustrated with Chromo-Lithographs, Engravings, and Maps. Volume I. Philadelphia, New York, and Chicago: The F. A. Davis Company, Publishers, 1898.

Dr. Sajous and his collaborators, together with the essential aid of the publisher, have produced a work of inestimable value to medical practitioners, and in this class must be included all specialists of the healing art. The debt which the profession owes Dr. Sajous for his untiring labors in bringing this work, in its condensed form, to their attention, and thus relieving the busy and overworked practitioner, may never be paid, but it certainly must be appreciated, and should be fully recognized.

The editor says in his preface, "The work, when completed, will present all the general diseases described in text-books on practical subjects,—medicine, surgery, therapeutics, obstetrics, etc.,—and inserted in their logical order in the text all the progressive features of value presented during the last decade. This will remove the cause of dissatisfaction caused by the absence of general subjects in the older work. If the year brings forth nothing new upon

any particular disease, the latter will, at least, appear as it was when last studied, whether this be one, two, five, or twenty years before. The general arrangement adopted will make it possible to cover the entire field in six volumes."

The subjects are arranged in alphabetical order, and are treated in an exhaustive manner. The article on "Abdominal Injuries" contains one hundred article excerpts, besides the general text. This article opens the book under A. This letter covers the larger portion of the volume, or five hundred and thirty pages. The balance is made up under the letter B. These pages are arranged in double columns, the text in clear type, cases and literature in smaller type. The arrangement seems to the writer particularly effective for study. In illustration, the portion devoted to *abscess*. The derivation is given followed by a full definition. This is succeeded by "varieties, etiology, pathology, location (organ or tissue involved), symptoms, differential diagnosis, prognosis, treatment," followed by external remedies, surgical measures, and full excerpts from the literature of the subject.

The therapeutics of this volume forms an especially valuable part of it, including many recently introduced remedies, at the same time discarding many obsolete agents.

While the scope of the work covers all that has been found valuable in medicine for a series of years, and does not, perhaps, enter directly into the practical work of dentistry, it is nevertheless very important for the members of this specialty; in fact, when complete, it will be an entire library to which they can refer upon all occasions, and will lead to the avoidance of error in quoting, an unfortunate tendency with many young writers. The work can, therefore, be recommended without reserve as altogether the most complete and satisfactory cyclopædia within the knowledge of the writer.

DESCRIPTIVE ANATOMY OF THE HUMAN TEETH. Fourth Edition.

By G. V. Black, M.D., D.D.S., Sc.D. The S. S. White Dental Manufacturing Co., 1897.

There is no better evidence of the value of a book than the successive editions called for, and this, the fourth edition of this valuable work, is satisfactory proof, if any were needed, that it has filled a prominent place in dental teaching, and continues to hold the position occupied by the first edition.

The subject-matter of the volume was so thoroughly gone over in preceding editions that there has been but slight changes demanded for this, the fourth, and these "consist in the introduction

of tables of the angles of teeth, intended to aid the student in fixing these in his mind and in the introduction of the word *embrasure* as an additional technical term." This addition, though covering but limited space, is especially valuable, as it will clear up in the minds of readers a somewhat obscure matter and lead, it is hoped, to more definite descriptions by writers. It is questionable, however, whether the introduction of the word *embrasure*, while correctly applied, will tend to give any clearer idea of the space between the proximal surfaces widening towards the buccal and lingual surfaces. The tendency to increase the terms used in dentistry is not to be commended, and while the motive is good, the practice is leading to great confusion in descriptive work.

The book has been so carefully reviewed in previous editions and has been so fully appreciated that it seems unnecessary to say more than that it will, probably, remain for the future, as it has in the past, the most satisfactory work upon the anatomy of the human teeth, and there does not seem any reason to expect that it can ever be superseded as a text-book.

A TEXT-BOOK OF DENTAL PATHOLOGY AND THERAPEUTICS, INCLUDING PHARMACOLOGY. By Henry H. Burchard, M.D., D.D.S. Philadelphia and New York: Lea Brothers & Co., 1898.

This work, by Dr. Burchard, was placed in the hands of the editor too late for review in the present number. A cursory examination of its contents leads to the opinion that it will fill a place not heretofore occupied, but whether it will meet the expectations of workers upon similar lines of practice must be left for decision through more careful reading.

A full review will be given in the July number of this journal.

Domestic Correspondence.

A REPLY TO THE EDITOR'S QUERY.

TO THE EDITOR:

SIR,—I note on page 326 of your May issue a request for explanation of "Section 7, Article XIV.," Constitution of National Dental Association (the words quoted, however, being from Section 6, not 7). As Article XIV. is wholly devoted to the Branch feature

of the National, my official position has caused me to study the provisions of this article very closely. I therefore venture my opinion as to the meaning of the section to which you refer; this, with the views of others which you will doubtless receive, will, I hope, help you to a clearer understanding. I should say that the words which you italicise—viz., “*And such delegates shall have the same standing in the National Association as though admitted (directly from the State societies)*”—have the same significance as the following bracketed words, which I hope you will understand more readily: “*And such delegates shall have the same standing in the National Association as though admitted (at a meeting of the main body, instead of at a meeting of the Branch).*”

Yours truly,

WM. ERNEST WALKER.

PASS CHRISTIAN, MISS., May 9, 1898.

Notes and Comments.¹

A NEW ARTICULATING PAPER.—The following is suggested by the *American Dental Weekly* to be used for articulating in default of the usual paper: Take a little thin paper, wet the finger with alcohol or water, and rub on a little polishing rouge. This dries quickly, and takes but a few minutes' time to prepare.

THE REMEDIES TO USE.—Dr. Welch, in a recent issue of the *Dental Brief*, says that it is much better to have a few good familiar remedies on hand than many that you are in doubt about, or that you are experimenting with. So with your treatment of a given class. Make a study of them till you are clearly satisfied with what you should do, and then do it. Continually varying your remedies and your practice is confusing, and tends to indecision and unreliable practice. Not that we should never take on anything new, or never discard anything old, or never vary our practice, but have some things settled, and as many things settled as

¹ The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 1338 Walnut Street, Philadelphia.

possible, and then in investigating new things or processes go at it deliberately, systematically, and intelligently, and settle that. This never knowing and being forever coming to a knowledge of the truth is vexatious, bewildering, and childish.

STUDENTS PRACTISING DENTISTRY.—The *Dominion Dental Journal* says, "There should be a severe example made in the colleges of the first student caught practising for fee or reward on his own account. Such conduct in medicine or law is simply impossible, but in dentistry it has become a very general custom. Several cases have come under our own notice the last month where second-year students have made full upper sets for five dollars 'on the quiet,' and for parties who were quite well able to patronize regular licentiates. In fact, the custom has become such a fad that the rooms of some of these students in boarding-houses are unlicensed offices on a small scale, and a system of tooting for patients has even extended on the sly to the infirmity patients.

"It is generally this class of students who degrade the profession by cheap fees when they get into regular practice. It is a fact, too, that we have some very indigent young men in the ranks. Their poverty is no crime, but unfortunately they imagine it ought to justify them in breaches of law."

SUPPRESSING IRREGULAR MEDICAL PRACTICE, A NICE LEGAL POINT.—The Medical Syndicate of the Southeast (Franco), wishing to convict a curate healer of unlawfully practising medicine, sent to the said curate two men, who on several occasions presented themselves at his consulting-rooms. They were examined by the curate, who subjected them to auscultation and percussion, and gave them a prescription, for which they paid him each time two francs. Fortified with this testimony, the Syndicate prosecuted the curate. The decision of the court was that the accused had instituted medical treatment in the case of the witnesses, but that as neither the one nor the other had really been sick, the curate could not be charged with illegal practice of medicine; in consequence "of one of the elements of the misdemeanor—namely, a disease—not being in evidence, the infringement with which the curate had been charged could not have been accomplished, for lack of an object." Upon this the curate, who was convicted of having practised medicine illegally, but in this particular case of having made use of it

without practising it because the subject was not diseased, was acquitted.—*New York Medical Journal*, February 26, 1898, p. 290.

INVESTMENT, CLEANLY AND TIME-SAVING.—Woolly asbestos, well saturated with water, forms an investment that in many cases fully replaces the usual plaster and sand, with the advantage that it is more cleanly to handle, does not run into the cracks and crevices we desire to fill with solder, and there is no waiting for it to harden. The blow-pipe flame may be safely directed upon it immediately. The pieces to be united, held together with hard wax, may be embedded in it with the same facility as in plaster and sand. Without a moment's delay, the investment may be dried out and the wax burned off at the blow-pipe, instead of chipping it away, flux and solder applied, and the soldering completed in less time than is usually required for plaster and sand to harden. The investment does not crack, but with as little or even less mass than required of plaster and sand securely holds the parts together. Woolly asbestos is not expensive, and as it can be used over again repeatedly, the cost is trifling. With a little practice its use may with advantage be extended to many cases in which heretofore plaster has been considered essential.

TOOTH-WASHES AS THE CAUSE OF EROSION.—In a paper presented to the Odontological Society of Chicago Dr. A. W. Harlan says, "Most of the erosions that we have on teeth, if not begun by the use of these feeble, diluted acid lotions and washes, are carried along by the injudicious and too frequent use of tooth-brushes, tooth-rubbers, tooth-pastes, and powders containing ingredients that are not soluble in the fluids of the mouth or in water. Half of the ridges and grooves, and even disfigured faces of teeth that we see, are brought about through these means."

ARTICULATION AND OCCLUSION.—The correct dental uses of these words seem doubtful in the minds of many writers on dental subjects. In the 1896 report of the American Dental Association Committee on Nomenclature it is said that, "The meeting of the masticating surfaces of the upper and lower teeth is frequently spoken of as an articulation; it is more accurately described by the word occlusion." Dr. W. Storer How, in the *Dental Cosmos*, says, Would it not be more exact to use the term occlusion to de-

scribe the mere meeting of a lower tooth with an upper tooth, or of lower teeth with upper teeth, and when the antagonizing, opposing, or impacting teeth meet in their normal break-joint relations to each other, describe the result by the term articulation? The appliance aiding in the production of proper relations of occluding artificial teeth may therefore be correctly termed an articulator.

It must thus be obvious that simple contact of the occlusal surfaces of teeth in the mouth may or may not be articulating contact, but the process of proper mastication requires the *occlusive articulation* of the natural or artificial teeth, as the case may be.

These illustrative examples should serve to clearly discriminate the two words and clarify the current confusion regarding their related yet distinct significations.

OUR PORCELAIN TEETH.—There are no dentists of experience and artistic tastes who have not realized the serious faults in the porcelain teeth of all the manufacturers of to-day, and yet, to use a familiar phrase, few of them do any "kicking." There is no one thing in the making of a set of teeth that gives us as much annoyance as the selection of teeth—simply a set of plain rubber teeth—at the dental depots. I oftentimes look over the large stocks at our depots and fail to find what is needed. Seeking first the size and shaped mould, then the color, and finally (and this is where the main trouble lies) to see what sort of bicuspid and molars have been combined with the fronts.

I presume most dentists think the fourteen teeth are made in one mould. The fronts are made in one mould and the bicuspid and molars in another. They are combined in sets by the girls who place them on cards, but under the direction of the superintendent. But, after all these years of experience, there is no judgment whatever used in making the combinations. Go to any stock of teeth and you will find complete verification of my statement. Here is a set of large front and small back teeth,—small fronts and large back teeth, and often the bicuspid longer than the cuspid. . . .
—*Dr. Haskell in Dental Review.*

A METHOD OF CROWNING BROKEN-DOWN TEETH.—We are frequently called upon to crown badly broken-down teeth, or where devitalization of the pulp is not expedient, or is objected to by the patient, as in short lateral incisors, or denuded teeth. To meet such

requirements the following method is recommended by Dr. C. J. Hand in the *Ohio Journal*. He says, in part, "After trimming, so that a band can be accurately fitted, make a band of thin platinum to cover all exposed portions of tooth or root, and solder with pure gold. (Of course, it is supposed that the labial wall has been bevelled as much as possible to permit the facing being brought in line with the adjoining teeth.) Instead of using a thin facing, secure a Bonwill crown, one that will nicely fit the space, and grind out the lingual portion, leaving the sides intact. Grind till the tooth can be placed over the platinum cap in proper position. It can now be waxed to the cap, invested, and body added to restore form ; or, better still, a little body mixed thin and placed on the porcelain and platinum cap, gradually raising the heat till fused. This method not only saves time, but prevents the investment absorbing the water in body and causing a porous bake. The crown is much better than a facing, as it prevents the difference in color at sides, which it is almost impossible to prevent when body is added to a facing. If care has been used the crown will go to place accurately and present a very natural appearance.

FRESH AIR, NOT VIOLENT EXERCISE.—What a man of to-day needs most, says the *Annals of Hygiene*, is not athletics in a gymnasium, but plenty of fresh air in his lungs. Instead of a quantity of violent exercise that leaves him weak for several hours afterwards, he needs to learn to breathe right, stand right, and sit right. The young man or young woman who starts on a career of training and keeps it up year after year, just at the time when the body has a great deal of its own natural work to do and wants to do it, may make up his or her mind that beyond a showy and superficial development of muscle and strength, all this training is going to count against them in after life.

INDIA-RUBBER AND INIQUITY.—From the *Pharmaceutical Era* the following information concerning the gathering of our crude rubber is taken. A Danish missionary has made some revelations concerning the rubber trade on the upper Congo. He says the white man wants india-rubber, and is in a hurry to be rich ; and to terrify the black into rendering the utmost possible amount of labor the rubber-gatherers whose quantity falls below a certain weight are either shot or deprived of their hands. Rows of hands stuck

on trees or heaps of them forwarded in baskets to European officers, or to native sergeants under their command, serve as an object-lesson to all. Rubber-gathering is a slow and difficult task, and whole villages are depopulated in order that their inhabitants, men, women, and children, may be sent on the search. Companies of black troops organized by white officers impress the villagers into this new species of slavery, and the reverend gentleman declares that he has seen forty-five villages burnt down and two abandoned through the rubber trouble. If these statements are reliable, the amount of iniquity represented by a stock of rubber goods must be alarming.

Current News.

THE NATIONAL DENTAL ASSOCIATION.

THE next annual meeting of the National Dental Association will be held in Omaha, commencing on Tuesday, the 30th day of August, 1898.

Attention is called to the fact that all who were members of the American Dental Association and of the Southern Dental Association at the time of the formation of the National Dental Association are now members of the latter organization.

The Constitution, Article III., Section 5, provides as follows:

"It is hereby specially provided that all persons at present permanent members of the American Dental Association and of the Southern Dental Association are permanent members of this Association, and entitled to all the privileges of the class to which they belonged without further action, and the treasurer is hereby directed to transcribe their names upon the roll of membership of this Association."

The officers of the National Dental Association will leave nothing undone to make the meeting at Omaha a success, and they hope the attendance and interest in the first active annual meeting of the Association will be commensurate with its importance.

By order of

THOMAS FILLEBROWN,
President.

EMMA EAMES CHASE,
Corresponding Secretary.

AMERICAN MEDICAL ASSOCIATION, SECTION ON STOMATOLOGY.

PROGRAMME of the Section on Stomatology of the American Medical Association at Denver, Col., June 7 to 10, 1898.

Dr. G. V. I. Brown, Milwaukee, Wis., Chairman's Address.

Dr. W. B. Hill, Milwaukee, Wis., "Methods of Teaching Materia Medica with Special Reference to the Needs of Dental Students."

Dr. G. T. Carpenter, Chicago, Ill., "A Method of Handling Alveolar Pyorrhœa."

Dr. W. H. Hall, Denver, Col., "Only a Baby Tooth."

Dr. J. Taft, Cincinnati, Ohio, "The Management of Pulpless Teeth."

Dr. L. G. Noel, Nashville, Tenn.

Dr. W. Knight, Cincinnati, Ohio, "Epulides."

Dr. V. A. Latham, Chicago, Ill., "Dental Septicæmia of the Antrum."

Dr. A. E. Baldwin, Chicago, Ill., "Some Facial Deformities and their Prevention."

Dr. A. H. Thompson, Topeka, Kan., "Jaw Movements in Relation to Tooth Forms."

Dr. Eugene S. Talbot, Chicago, Ill., "Irregularities of the Dental Arch."

Dr. V. A. Gudex, Milwaukee, Wis., "The Resistance of the Mucous Membranes to Bacterial Infection."

Dr. A. H. Sawins, Denver, Col., "The Morbid Susceptibility of Dental Structures is Greater than that of other Tissues."

Dr. J. M. Porter, Denver, Col., "Have We Progressed?"

G. V. I. BROWN, Milwaukee, Wis.,

Chairman.

EUGENE S. TALBOT, Chicago, Ill.,

Secretary.

NEW JERSEY STATE DENTAL SOCIETY.

THE Twenty-eighth Annual Session of the New Jersey State Dental Society will be held at Asbury Park, commencing July 20, and continuing the 21st and 22d.

The commodious and pleasant "Auditorium" has been secured for the sessions, with unlimited space for clinics and exhibits.

Papers and clinics from many eminent dentists have already been secured.

Preparations are being made for the largest display of electrical exhibits of appliances for the use of dentistry ever before given, one-hundred-and-ten- and five-hundred-volt current being attainable.

The hotel Columbia adjoining has been secured for head-quarters for members and visiting friends; rates will be \$2.50 and \$3.00 per day.

CHARLES A. MEEKER, D.D.S.,
Secretary.

H. S. SUTPHEN, D.D.S.,
Assistant Secretary.

NEW JERSEY SUMMER EXAMINATIONS.

THE New Jersey Dental Examining Board will hold the summer examinations at the commission rooms, No. 88 Broad Street, Elizabeth, N. J., commencing on Tuesday, July 5, and lasting for three days. All applications must be in the hands of the Secretary before June 21.

Attention is called to the new dental law of the State, which requires preliminary education equal to a high-school graduation in New Jersey. Candidates, who have not the necessary papers to show this standard will be given an examination held under the supervision of the State Superintendent of Public Instruction; all preliminary examinations must be finished before the applications can be accepted.

G. CARLETON BROWN,
Secretary.

NO. 88 BROAD STREET, ELIZABETH, N. J.

MISSOURI STATE DENTAL ASSOCIATION.

THE Thirty-fourth Annual Meeting of the Missouri State Dental Association will convene at Merrimac Highlands (near St. Louis), July 5, 6, 7, and 8, 1898.

All dentists practising in the State who are not members and

wish to become members of the Association and dentists of other States are cordially invited to attend.

When purchasing your railroad ticket, remember to get your certificate from the ticket agent, so that you can get the rebate on your return ticket.

A large attendance is anticipated, and we are assured of a royal meeting.

H. H. SULLIVAN,
Recording Secretary.

KANSAS CITY, MO.

COLORADO STATE DENTAL ASSOCIATION.

THE Twelfth Annual Meeting of the Colorado State Dental Association will be held in Denver, June 7, 8, 9, and 10, in conjunction with the Stomatological section of the American Medical Association.

An excellent programme is assured. Those attending may avail themselves of reduced railroad rates. A cordial invitation is extended to all members of the profession.

ARTHUR C. WATSON,
Chairman Executive Committee.

PENNSYLVANIA STATE DENTAL SOCIETY.

THE Executive Committee desires to announce that, on account of circumstances over which it had no control, the place of holding the annual meeting has been changed from Cresson to Ebensburg.

The Committee feels that in selecting the latter place it has acted wisely. Ebensburg is the county seat of Cambria County, and is a most delightful old town, located on the summit of the Alleghany Mountains, and readily accessible via Pennsylvania Railroad and Cresson. Head-quarters will be at the Maple Park Springs Hotel, and the meetings will be held in the court-house. Booklet and programme will be sent out about June 10.

Annual Session, July 12, 13, and 14.

I. N. BROOMELL,
Chairman Executive Committee.

THE International Dental Journal.

VOL. XIX.

JULY, 1898.

No. 7.

Original Communications.¹

SECRETS AND PATENTS *VERSUS* PROFESSIONAL PROGRESS.²

BY J. MORGAN HOWE, M.D.S., M.D., NEW YORK.

STATEMENTS and discussions relating to secrets and to patents have been frequent enough during recent years and months to justify the conclusion that further agitation is timely, and will hasten the establishment of true moral standards.

Whether we call ourselves *a profession* or claim the connection of a *specialty* in a kindred profession, our claim to professional character, in any liberal sense, depends not on the nature or kind of work which we do as individuals, but on our relation to and treatment of each other and of the public. Quacks and charlatans work with more or less skill in the same sphere as do honorable members of the professions, but that does not give them professional standing. We began to be a professional body when less than sixty years ago our honorable predecessors organized the first dental society, issued the first dental periodical, and established the first dental college. These institutions were founded to oppose the continuance of isolation among practitioners, to break down the

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before The New York Institute of Stomatology.

barrier of secrecy that prevailed, and to begin the interchange and general dissemination of knowledge. It was a distinctly altruistic movement, made, despite much opposition, by the most intelligent and prosperous of our craft, who could well have afforded to allow things to remain as they were; for the benefits to accrue were more for the uninstructed and for the coming practitioners than for themselves.

There are men now living and practising who were in practice at and before that time, and I cannot do better than quote from the recently published "personal recollections" of one of them. Dr. Charles Merritt says of the absence of professional feeling among dentists, "Every new discovery or improvement made was kept a profound secret. No dentist with any reputation would allow another to see him operate, or let him get a peep into his laboratory, fearing that some of his cherished secrets would be stolen. . . . There was no organization of dentists, no real professional history. Each man was a law unto himself and pursued his own independent course, devising his own methods and practising according to his own knowledge, with no ethical code to restrain him."¹ From such a condition of isolation as this we began to emerge when the instrumentalities were set at work to accumulate a common fund of knowledge, and to establish mutual fraternal relations, obligations, and privileges, which would bind us together as a professional body.

We are accustomed to auto-congratulations in regard to the phenomenal progress that dentistry has made during recent years, but we have not always remembered the forces from which these constant advances have received continual impetus. Real professional progress in any line depends upon the general diffusion of a scientific spirit, which prompts to the imparting of information for the benefit of all, no matter how the knowledge is obtained. From knowledge thus received, added to, and in turn imparted, the successive advances are made that raise the level of intelligence of the whole professional body. By such methods the least enlightened has the means of advancement offered him as freely as any of his *confrères*. Our professional progress has been due to such liberal influences, which have prevailed, notwithstanding a constant tendency on the part of some to attribute that progress to the materials incidental to increased intelligence, instead of to educational advancement coupled with professional sentiment. A recent circular of the New York Academy of Sciences says of the investiga-

¹ The Dental Practitioner and Advertiser, January, 1898, pp. 12-15.

tions of scientific men, "Their results are freely given to the world for the benefit of all," and it is this characteristic and others of similar nature that must be a distinguishing mark between the professional man and the man of business who uses his knowledge in manufacture and trade.

All organizations of men necessarily require the individual to relinquish something in return for advantages and benefits received, and to accrue through like action on the part of others. If we consider even so commonplace a relation as that of citizenship, we remember that one is required to give up time to serve the State as jurors and as militiamen; to pay money in taxes; and even in some cases to give up our right to do as we wish with our material possessions. In thickly settled communities we are restricted as to how we shall locate our house on our own property, of what material we shall build it, and what the character of the conveniences shall be that we put inside it. All such and many other instances of yielding up of rights and privileges, for which the barbarian would fight, are peacefully conceded for the general good, as civilization advances. And similarly, as the processes of evolution proceed and society becomes more complex, other organized bodies must require concessions peculiar to themselves, which also imply the giving up of rights or possessions in return for benefits conferred. There is no doubt about the legal right of an individual to withhold information regarding any knowledge he may acquire; but if he belongs to a professional body, and the information he retains for his own use relates to the work of his *confrères*, he is evidently returning to the practice of those who thus withheld knowledge before the organization of the professional body began. Relevant to the provision of the medical code against the use of nostrums, an editorial in the *Dental Cosmos* not much over two years ago¹ objected in the strongest terms to the advertising of nostrums in medical and dental journals, as well as to the use of such compounds by practitioners, but all the force of the article was directed against medicinal preparations. *Nostrum* is the Latin word for *our*, *ours*, and is supposed to be applied, as it is, from "the habit of quacks and other advertisers of claiming special virtue for their wares as 'our own make,'" and, although more commonly applied to medicines, is equally applicable "to any scheme or device of a quack or charlatan."² I submit that no use of the word could

¹ *Dental Cosmos*, vol. xxxvii. p. 723.

² *Century Dictionary*.

be more appropriate than its application to the secret formulæ of alloys and cements that are offered us in all dental journals. Dr. Ottolengui has also given a valuable contribution on "secret remedies,"¹ but he also confined his attention to drug compounds, and ignored all consideration of the compound remedies for dental caries that we are all using constantly. Whether it has occurred to either of these gentlemen, who edit journals for supply houses, that the secret and nostrum character of the alloys and cements, in which their firms and most dealers are interested, is the same as that to which they object in drug compounds, does not appear; but I am sure the logic of their convincing arguments against secret remedies and nostrums will lead most of us to include these filling compounds as differing not at all in principle from other secret preparations.

During the last three years we have had very full and valuable publications from Dr. Black, as the result of his scientific study of amalgams, but as yet it seems as if we were receiving no benefit from the information he has imparted, as every manufacturer and dealer in supplies has his own compound, which he is most anxious to sell.

Dr. Crouse, for the Dental Protective Supply Company, while acknowledging his indebtedness to Dr. Black's publications and suggestions, by adding to these his own investigations, has "solved the problem at last" and produced "the only perfect alloy," but he objects to revealing the results of his studies or the composition of his product. I question the propriety of calling this compound "Fellowship" alloy, because it embodies such a flagrant violation of that professional sentiment which expects members of the body to contribute of their knowledge to the common fund as freely as they have received. Dr. Crouse, in reply to a letter written him in January last, calls the proposition to publish the formulæ of alloys "absurd,"² and thinks that such publication has been "detrimental to the dental profession," and that it has been a reason for the production of "worthless preparations" and of constant variations in quality. He thinks he can "best help my (his) profession" "not by giving them a formula," especially in view of the cost to the Supply Company of a metallurgist, months of time, and expensive instruments. He says, "Why should the conclusions arrived at be made public?" "This course would be manifestly unjust to the stockholders."

¹ Items of Interest, April, 1898.

² Dental Digest, February, 1898.

The statement is from the manufacturers' stand-point. His interest in maintaining secrecy is frankly admitted, while, on the other hand, he claims it is good for the "profession" to be kept in ignorance, because the "worthless preparations" on the market are the result of the publication of formulæ.

It does not seem as if this reasoning is convincing or acceptable to dentists who regard their vocation as a professional one. We are all very thankful, I am sure, to Dr. Crouse for his services in connection with the Protective Association, but we may decline, I hope without offence, the proffer of a guardianship that would shield us from too much knowledge. On the contrary, it is time in this stage of our maturity to demand such knowledge, even if stockholders have to accept less dividends.

Dr. Flagg and a very few other manufacturers of alloys have published their formulæ. Dr. Keller published not only the composition of alloys that he made, but also the results of analyses of sixty-five secret compounds then upon the market.¹ There would seem to be no objection possible to the preparation and sale of known compounds by a professional man to his *confrères*. Pains-taking care and skill in such work—as in everything—is worth paying for; but such a question by a dentist as "Why should the conclusions arrived at be made public?" takes us back to early days. It is the same question in effect that those men asked who opposed the efforts of Hayden, Harris, Parmly, Flagg, and others, who began the agitation for the establishment of our professional relations. It has a tone of antiquity about it that in these days of societies and journals sounds strangely coming from a member of a profession. Although paradoxical, it shows that we are a youthful body. Our willingness to continue buying and using secret compounds, for which extravagant claims are made, must be due to mental qualities similar to those which keep up the sales of quack medicines to the general public. But those who claim to be professional men should certainly rise above such a level. We cannot blame the proprietors for taking advantage, as business men, of the desire to buy what they have for sale; but to argue that it is not good for professional men to know what they are using is certainly unique. Of course it is recognized as an easy matter to analyze any inorganic compound, so that the composition may certainly be known, if it is really desired; but the question of interest just now is, What relation does a so-called professional man hold to his fellows

¹ American System of Dentistry, vol. iii. p. 813.

who withholds information for gain? I contend there is as much justification for expecting and demanding the giving up of secrets as there is that members of a professional vocation should conform in any other way to the consensus of opinion concerning what is favorable to progress. There is no more right or reason in an interdiction against public advertising than against making, selling, or holding an interest in a secret nostrum, for both are an injury to the profession as such. The moral status of any course of action may be justly estimated by calculating the effects of such conduct on the whole body, if all its members resorted to similar behavior. Applying such a test to secrecy, the conclusion must be, if it would be an injury to the professional body for all our members to withhold information, to reserve for their personal benefit everything they can turn to their own advantage, and cease all efforts to enlighten for the sake of elevating professional status; then there is no question that he who claims exemption from the liberal usage—which brought us out of the chaotic condition of former days—is working an injury to the extent of his influence.

Solicitude has been recently expressed in regard to the increase and success of the so-called "dental parlors," conducted with brazen advertising of "painless" operation and flaunting college degrees. Why should these men be asked to give up their legal right to use such means as they find of pecuniary advantage. They have as good reason for claiming their right to do as they please in their method of obtaining business as have those who in any other way seek their own interests, without regard to their effects upon the profession of which they claim to be members. Their methods are forbidden because they injure the professional body. The right must be relinquished for the general good. A general desire among dentists to know the composition of all the compounds they use, and a determination to deliver themselves from their present bondage, together with the establishment of an antiseoret ethical standard by dental societies and schools, will do more than anything else to make publications, such as Dr. Black's, of service to all dentists, and at the same time make all dentists more intelligent and better professional men. It is an entirely practical proposition that we should have compound filling-materials made from known formulæ by experts, who will serve us as willingly as pharmacists now serve physicians; and the practical way to bring about the change is for dentists to cease using secret compounds. Publication of formulæ will be general when it is found to pay. Chemists and metallurgists will fill orders when they are employed.

It would be superfluous to take time here in condemning medicinal nostrums ; the arguments against them, before mentioned, are conclusive ; but there is no consistency in seeking to maintain a professional standard in regard to one set of materials and permitting, without protest, the level of trade to be continued regarding other substances, in which we are fully as much interested.

The only logical position we can occupy is that full and free dissemination of information concerning all things connected with our work is required for professional development, and no less will be acceptable.

If there is anything more inconsistent with professional progress than secrecy it is the revelation of ideas by means of letters patent. There is no doubt that the intention of patent laws is to stimulate invention, and it will not be denied that they have done so to some extent. But it is well known that a decided objection exists in the medical profession against the obtaining of a patent by a physician on any invention pertaining to his professional vocation. Among dentists such objection has not been so generally recognized, and there is probably some difference of opinion among those who have no direct pecuniary interest in fostering the belief that patents are a benefit and not an injury to the true interests of our specialty. On this point I desire to discuss the matter further, and to make some application to present conditions.

There is probably nothing under human control that is either wholly good or totally evil. This applies to men's characters and to all their schemes and devices. I do not propose to argue that the effects of patents are entirely evil. It is claimed and may be true that patent laws have been of great benefit to the public by stimulating and rewarding invention, but if so, the public has, nevertheless, been obliged to pay very dearly for the advantage. Time would fail to discuss the subject on this broad plane, but I wish to present reasons for the claim that a profession cannot permit its members to patent inventions, because the evil effects far exceed any possible good. Medical and other scientific men are stimulated to devise, invent, or discover, so far as in them lies, by a scientific or professional spirit ; and the commercial instincts of some are, no doubt, restrained by the code of ethics which forbids them from patenting productions that may be of use to their *confrères*. They may copyright their books or other productions, and they receive pay for all forms of teaching, as do all professional men ; so the objections to their obtaining a patent on devices for technical use cannot be on the score of their remuneration increasing the cost of

the article. Dentists who have argued for the privilege of patenting, while remaining in good standing, have claimed that it is no more than is conceded to the man who copyrights his book ; but it is more and different ; because the man who obtains remuneration through copyright does no harm, but the professional man who seeks reward by means of patent does harm to the body of which he is a member, through power which he holds, or conveys to others, to repress the productions of his *confrères*.

Mr. David McGregor Means, of the New York bar, wrote on the difference between the general effects of copyright and patent right at the time of the discussion of international copyright.¹ He said, "This right, far from being mysterious and questionable, is one of the simplest and clearest with which jurisprudence can deal, and is, moreover, exactly defined by the term in common use,— 'copyright.' It is the right to copy, to imitate, to consciously repeat what has already been done, and negatively the idea of originality in labor, in thought, or in discovery. The expression 'property in ideas' is a peculiarly unfortunate one to apply to this right. It implies either that the holder of copyright and his assigns are the only persons entitled to think certain thoughts, to entertain certain ideas, or that they alone may practically apply the thoughts or make use of the ideas. Neither of these implications has the slightest support in the facts of the case."

But "this expression is not improperly applied to the right conferred by letters patent, which is of an entirely different character from copyright. The holder of a patent cannot, it is true, prevent others from thinking his thoughts and having his ideas, but he can prevent them from making any practical use of these thoughts and ideas. He can prevent them from moving portions of matter in a particular manner,—that is, in conformity to certain ideas ; and as all labor consists in moving matter, he has a legal monopoly of certain modes of labor. There may have been a hundred men working independently, to each of whom the same idea would have occurred at almost the same time, but the one that patents it may forbid the rest of mankind from applying it in the use of their property. The idea may have come to the discoverer by accident and without labor on his part, while accident has prevented those who sought for it from finding it ; that makes no difference with his legal right." Copyright "confers no such monopoly. The ideas contained in a copyrighted book are no one's

¹ "Concio ad Clerum," the Nation, July 10, 1890.

property. They may be, every one, expressed in other words which may be printed and published; they may be memorized; they may be applied to any use by any person, and the right of the author is not infringed. By this right no human being is prevented from making any use of his mind or of his property that he pleases, while it may suggest to him novel uses of both. By it no man is hindered from doing what he would have done did it not exist." It is clear from these statements that there is not only a radical difference between copyright and patent, but that the latter must necessarily be a hinderance to professional progress in material devices, as well as in the diffusion of professional feeling.

We know from experience and observation in our own vocation that patents have been a hinderance to progress by preventing improvements being made on devices which could be made more practical; by preventing the production of new devices if they have in them even a modicum of the ideas that have been patented; and by suppressing the production of other patented inventions by shelving, when the sale of something in the market would possibly be reduced by the substitution of an improved device.

There are many inventions now hidden from general knowledge that would facilitate work and suggest further advances, but for the pecuniary interest created by patents in smothering such devices in order that the market value of certain other things may not be lowered.

All these repressive powers are exercised by business men to whom dental patents are sold. Besides, there is the power to harass, annoy, and oppress by the license requirements of patent-holders, of which we had an extended knowledge under the Vulcanite Company, and more recently a foretaste of similar bitter experiences with the Tooth Crown Company. These organizations were based on patents obtained by dentists, and sold to those who organized the corporations for the purpose of exacting oppressive tribute from the dentists of the whole country. Much credit is due to Dr. Crouse for organizing the opposition to the latter company; but resistance has been successful only in the degree that the patents have been proved invalid. If the patents of the Tooth Crown Company had been held valid, the dentists of the country would now be in the grasp of that company. We have escaped thus far only by virtue of the invalidity of their patents. When another company is organized with a basis of valid patents, we will not escape its exactions, although the ablest legal talent and every dentist in the land contribute to the defence. Dentists have only

to go on patenting whatever they can, and selling their patents to whoever will buy, and the organization of such another company will not be long deferred. If the patents prove valid, escape is impossible.

Then there is also the additional obstacle to professional growth in the patenting of modes, or methods, of performing operations. Under such patent powers a man may be punished for following the dictates of his judgment, in doing what his patient needs to cure his disease, correct his deformity, or even save his life.

In all these ways patents are an injury to any organized body of a professional character, and no member of such a body has a moral right to inflict such an evil on the body from which he has drawn that which has helped to make him what he is. I have not mentioned the increased price for patented things as detrimental to professional progress, because relatively it is of minor consequence. Objections to patents in a profession are not at all based on a desire to evade remuneration to the inventor through a reasonable increase of price, but on the fact that he cannot secure remuneration by means of the patent without inflicting serious injury on the profession. Ready acquiescence in copyright shows plainly that no professional man objects to compensating his *confrère*, but the power to monopolize ideas, to forbid improvements, to shelve new inventions, to impose humiliating as well as exorbitant license terms on patented methods as well as things, in addition to remuneration, deservedly excites opposition. Such power is opposed to the fundamental ideas that distinguish a profession from a trade; and the more certainly valid the patent proves to be, the more resistless the power to check professional progress.

The justice of the plea favoring patents because the inventor ought to be paid is called in question by the fact, well known to most of us, that original inventors really get very little when they patent their inventions. When money is made from patents, it is almost always the business men, who buy and exploit them, that get it. And then original inventors among us are not so eager to patent their contrivances as are those who appropriate their ideas. Many of our most valuable devices have been freely given, and many patents have been obtained long afterwards on things that were originally given to their *confrères* by men of true scientific spirit. The screw for use in operative dentistry was patented years after it had been used and described by Dr. Dwinelle. Variations in the form of the matrix have been patented long after the original idea was given us by Dr. Jack; and even when a patent is

not possible, the same mercenary spirit shows itself in appropriating the inventions of others without credit, as in the case of Dr. I. F. Wardwell's invention twenty years ago of what are now called "detachable porcelains." Although described and illustrated in two text-books, they are now being advertised and sold as the product of another's mind.

Dr. Crouse is authority for the statement¹ that ninety per cent. of all patents on our appliances have been invalid; and it would seem that this must be in great measure due to the penchant for appropriation—conscious and unconscious—that has obtained such sway among dentists.

In addition to this, the statement is made² that all patents on mechanical processes, such as are used in our operations, have been declared invalid by the United States Supreme Court. So there remains less than ten per cent. of all our patents that have the questionable virtue of validity, and for the alleged benefits of this modicum we are actively keeping up a system against which at the same time we must protect ourselves by a continuous and desperate series of legal battles.

Among physicians and other scientific men the patent is not a necessary stimulus, because it has been, and is constantly being, shown that they are willing and even anxious to contribute their ideas in tangible, as well as in other forms, without seeking other reward than that which comes with recognition of ability.

One has only to visit the establishment of any large surgical or scientific instrument-maker to see a great variety of complicated as well as simple instruments for all medical or scientific purposes not protected by patent, and these are constantly being modified for improvement and increased in number. Such an exhibit shows that there is no lack of willingness to devise without the stimulus of patents; and it is evident, also, that the manufacturers of these devices are willing to make them, although not protected against the competition of other makers.

Denunciation of manufacturers and license corporations, patent-holders, because of alleged extortion in the price of patent permits or articles, appears to be inconsistent and ill-directed so long as dentists themselves are keeping up the supply of patents, which they sell generally for a paltry sum to those who really are the money-makers in the matter. The business men who make and

¹ Dental Digest, February, 1898.

² Ibid., March, 1898.

sell our supplies, and buy patents when they think them valuable, either to use or to prevent use, are merely taking advantage of the business opportunity which is furnished them by members of our own body. They are not professional men and ought not to be judged by professional standards; but for ourselves such ethical rules should be established as will disqualify from good professional standing those who obtain and sell the power to repress and harass their colleagues, for there is every prospect of the evils of patents, both valid and voidable, being in the future a greater curse than they have been already. We have the matter in our own hands as a professional body. If our societies take the matter into consideration and establish the best code of ethics attainable in our present status of professional development, if the students in our colleges are surrounded by a scientific atmosphere that scorns secrecy and repression, and if such a liberal professional sentiment is diffused as to make dentists generally interested in the composition of their materials, and to cause them to regard their professional standing and the interests of the professional body of more value than the sum they may hope to get from a patent, a great step forward will be made in professional progress. The effort being made by Dr. Ottolengui for a general petition to Congress for an amendment to the patent law, so as to prevent the issuing of patents on operations and processes, ought, if feasible, to receive the hearty approval and co-operation of every one of us as an effort to lessen the evils of patents. I would approve of all and every means that can be made effectual to prevent or diminish the patent mischief at its fountain-head. The Dental Protective Association, under the able direction of Dr. Crouse, the dentist, has delivered us from the exactions thus far of those whose patents have proved voidable, but neither it nor any other defender can deliver us, as before remarked, from the exactions of valid patents.

We certainly need a protective association to defend us against the demands of those who have no just claims, and no such association could be better managed than the one now in existence, I am sure. But we need also to be delivered from the evils of valid patents, and there seems to be no other way than to raise the level of our morals sufficiently to reduce the number of those to a minimum who are willing to injure the professional body for the hope of gain.

We have undoubtedly been advantaged through the enterprise of manufacturers, but we have also been injured through their influence. There can be no doubt that trade interests are served by

the systems of secret formulæ and patents. Dentists must determine through their proper organizations in which direction they will move,—towards or away from the standard of a liberal profession?

The developed policy of the Dental Protective Supply Company, under the management of Dr. Crouse, the manufacturer, in conducting the business strictly on business lines, without regard to the effects of secrets and patents on professional progress, is likely to confuse the moral sense, because Dr. Crouse is also a dentist of prominence and distinction, and because other dentists are shareholders in the business, and still more dentists are being solicited to become shareholders. Good dividends are calculated to cause one to consider the methods or results of obtaining them, with a bias; and we may be sure that these professional shareholders in dental trade will hardly escape such influence. This is only one more deteriorating influence added to those that have been longer in operation.

Professor Peirce, of the Pennsylvania College of Dental Surgery, in a very recent paper,¹ makes a lament—in which I can but join—over the degrading influences of the commercial spirit pervading educational institutions and the inconsistency—or worse—of examining boards. I would suggest that the desired upward drift could as effectually begin in educational institutions as elsewhere. Let teachers begin to inculcate, by example and by precept, the lesson that the moral status of a profession determines its position in public estimation, and in great degree that also of every individual member, and the ascent will begin.

But if teachers and leaders grasp at patent prizes, how can the rank and file be expected to forego any chance for expected gain that seems within their reach? If colleges countenance and use secret compounds of certain kinds, what weight can attach to the professors' denunciation of nostrums of another kind. If students and practitioners imbibe—from teachers and journals and manufacturers—the idea that professional progress consists in patent devices, mechanical facilities, and secret compounds, what logical objection can be made to the embodiment of this notion in "dental parlors," in department stores, or elsewhere?

All professions are liable to have both their character and reputation impaired by the degrading influence of members who are indifferent or ill-informed regarding moral considerations; but dentistry

¹ INTERNATIONAL DENTAL JOURNAL, April, 1898, p. 207.

is probably the most vulnerable specialty in this respect, because it has not yet acquired the prestige and reputation of the older bodies, nor has it so far freed itself from those unprofessional ideas and practices that are connected with its embryonic state. We can the less afford, therefore, to ignore the need of ethical development, or to pass unnoticed the influence of practices that would cause retrogression.

These presentments are made in the hope of exciting interest and discussion, so that we may be brought nearer to the acceptance of the truth. If there are interests that "put golden padlocks on truth's lips," it behooves us to recognize the fact.

WHAT SHOULD BE THE CHARACTER AND POLICY OF DENTAL JOURNALISM?¹

BY LOUIS JACK, D.D.S., PHILADELPHIA.

It may be stated that the periodical literature of any body or association of men has a great influence upon its advancement and the individual development of those who sustain this interest. This kind of literature furnishes the stimulus to development, since it comes more closely in touch with the individual and tends also to unite the units of an association into a concrete body. Community of interest is exerted, material benefits are promoted, and whenever the policy is liberal and the tone of the journalism is high the general standard becomes elevated. This is more particularly the case with the liberal professions, because with these a broader spirit is expected and a higher estimation of ethical principles is necessary to be sustained.

Books written upon subjects connected with professional matters, or special scientific fields of endeavor, enlighten the student, but have no tendency to unite those interested into the associated effort. They do not weld men to each other, since the appeal is to the intellect only.

The periodicals of a profession, on the contrary, have the tendency to open up living subjects, and are deficient of animating power only when they fail to stimulate moral force and the inculcation of broad ethical standards.

¹ Read before The New York Institute of Stomatology.

We must in the final analysis judge each aggregation of men by their special literature, and more markedly by those elements which appeal to questions of right.

Dentistry, from the time of its first appearance in the days of Hippocrates and Galen to the early part of the present century, was pursued as an empirical art, growing slowly by the faint leakage from one isolated mind into another similarly situated. The darkness of ignorance was then general, as there was no adequate means for the dissemination of knowledge. In this country a spirit of improvement of the condition of dentistry began to move upon the existing chaos in the third decade. It appeared among those who were graduates or students of medicine, of whom there were a goodly number who had directed their attention to the field presented by the diseases of the teeth. Those practising in America at that time were composed of two classes,—those just mentioned, who were generally highly intelligent and of great earnestness; and an indefinite proportion of charlatans and itinerants, who went from place to place and house to house soliciting patronage.

The importance of the growing pursuit and its future interests led the qualified class to become associated first for the publication of a periodical devoted to the dissemination of dental science and art.

An appeal was made for the publication of a dental journal, which resulted in the establishment of the *American Journal of Dental Science*, the first issue appearing in 1839. The number of persons becoming responsible for the movement was one hundred and seventy-four, who agreed to take four hundred and eighty-seven copies at five dollars each.

Thus was established the first dental journal to appear in the world. It was strictly professional in character, and maintained in freedom of any outside impediment for many years.

The establishment of the *American Journal of Dental Science* was naturally followed by the organization in 1840 of the American Society of Dental Surgeons. This association was composed principally of those interested in the journal,—editors, contributors, and subscribers.

It will be noticed, in an examination of the events of the time, how intimate the relations of these two movements were.

These events had a marked effect. They were commendably noticed by the London *Lancet* and elsewhere.

It may be irrefutably stated that this was the initiation of a step forward, the effects of which were wide-spread, and which cul-

minated in the present system of dental education and in the establishment of dentistry as a profession upon a secure basis.

The single-mindedness, intellectual force, and moral steadiness of the leaders of these movements produced a great impression upon the mass engaged in practice. The evils of the dental practice of that period were met by vigorous denunciation. The particular evils of those times were the general ignorance of the mass who were practising and the disposition of many to withhold their knowledge of modes of practice from their fellows. The leaders were, from the influence of the medical profession and medical ethics, naturally liberal, and indisposed to accept personal advantage of any advanced methods of practice or of their inventive efforts. The present evils which have had a demoralizing influence upon the dental profession did not then exist.

In 1843 and in 1847 the two dental trade-houses then in existence, conceiving the advantage it would be to them, took the liberty of publishing each a dental periodical, by which they could secure a hold upon the rising profession, thus combining the dissemination of methods of practice and the promotion of their own interests by conveying description of their goods along with the literature contributed to them. The evident result, if not the intention, was the ultimate supplanting of the *American Journal* by offering the new journals at a much lower price. The *American Journal*, not having been pecuniarily profitable, was at length displaced as an independent journal.

Since that time journals independent of trade influences and trade support have been few and their course has been precarious. For obvious reasons, however strong the sentiment which called them into existence, they have had serious impediments to contend with, among which may be stated insufficiency of capital and indifference on the part of the profession from the absence of an active *esprit-du-corps*.

As the dental trade-houses have increased in number and activity, so have the journals connected with these houses been multiplied, for the reason that the cost of advertising in the journals of a rival house being nearly prohibitive, the necessity with each has been to go into the publishing business to promote trade.

It must be admitted that some of these journals have been of excellent character, and have been of immense service to the dental profession. Others have been very indifferent, and have done much harm from their low tone and the incapacity of their projectors.

Along with this experience in the past three decades have grown

up several evils which have not been counteracted by the trade journals. I have reference to *the great prevalence of dental patents, the dispensation and use of secret formulæ, and the organization and injurious consequences of the Dental Trade Association.*

The two first stated evils which are damaging to the growth and prevalence of true professional spirit have been encouraged and assisted by the trade-houses, and have not been counteracted by the articles and editorials of their journals.

Here it may be stated that the sinister influence of trade principles are inimical to the high standards and sentiments which should be the governing impulse of professional men.

The intolerance of the trade-houses has gone even further than the encouragement of these injurious policies, for they have endeavored in some instances to control the organization of dentists for protection against these transactions, as was evident by the direct interference with the efforts of the profession to organize for defence when the Cummings patent was resisted, and, again, the opposition has been open as well as covert to counteract the Dental Protective Association.

It comes with ill grace for dental journals to profess devotion to the interests of the profession when they fail to consider favorably those matters which are fundamental to the animation of professional ethica.

It is probably too late for reform to be expected of the trade-houses in the direction of discouraging the patenting by dentists of such simple matters as form the staple of the generally patented affairs applicable to dentistry, or to cease the dispensation of secret formulæ, or for their journals to discredit them.

In view of the wide-spread toleration of unprofessional conduct in the directions indicated, which are alarming to those whose earnest desires are to uphold the honor and dignity of the dental profession, there appears to the writer to be but one creditable position for every journal which professes to be devoted to the interests of dentistry, which is to counteract these two evils by constant references to the danger that is involved in them. Neither by favor nor by silence is it consistent with our general good that any interest should promote the extension of these baneful influences.

As the subject of patent claims and the impropriety of a professional man taking advantage of the privilege of the patent-office to put his profession under tribute to the establishment which purchases his claim is to occupy the attention of other speakers, I shall

not take your time further than to lay down the broad statement that it cannot be considered a professional act for one to make such a use of the small ideas involved in the mass of dental patents.

The instruments of surgery present a much larger evidence of inventive talent than is shown in the appliances of dentistry, and you are all aware that any attempt upon the part of a general surgeon to secure such personal advantage would howl him out of any medical society in the land.

The dental profession should impose the same requirements, and no journal should fail to defend the proposition that the sheet-anchor of professional respectability is the same liberality in respect to patent restrictions as is the basis of medical ethics.

The dental supply-houses have been largely responsible for the prevalence of the patent evil because it has been grist to their mills. While they have been fattening on the consequent tribute, their influence and temptings have had a corresponding deadening influence upon professional spirit. Their journals have encouraged by silence or by direct argument the propriety and justice of this practice. From Hill's stopping, which started the greed and set the pace in this direction, to the patenting of instruments, and at last to patenting processes, has been a steady decline.

The evil of secret formulæ has been a greater injury to our standing, and the use of such things a greater mark of indolence and unprofessionality, than patenting. It is more demoralizing, since it is a direct subscription to infamy each time one uses or purchases a secret preparation or proprietary medicament.

There can be only one course for the professional journal to pursue that has any claim to the patronage of our profession, which is to decry the practices which have grown up to such great proportions in the last two decades. This practice should be attacked at all points, and the dental societies should pledge, if need be, their members to avoid this mischievous course and to advocate the use of rational prescriptions.

One of the uses of the schools and societies is to instruct the student to carefully prescribe according to the indications, and the policy of dental journals should be to sustain the schools and associations in this direction.

There is another subject which affects the material interests of those practising dentistry which has not received any attention on the part of the dental journals.

The trade journals avoid any allusion to it because they are silent promoters, and the independent journals have refrained for

the reason probably that to discuss it would give offence. I allude to the Dental Trade Association, which is an organization of some of the leading supply-houses for the purpose of restricting competition and maintaining the price of their products. The members of this association are pledged under penalty to buy and sell their manufactured articles only of and to one another, any dealer outside of the association wishing to purchase of its members being required to pay the retail price.

It is not difficult to perceive that these principles of this association are restrictive of trade, and, being destructive of fair competition, tend to prevent lowering of the selling price of goods, and also by lessening the competition between the houses composing the association restrict as well the improvement in many lines of goods.

You have all had illustration of how in some cases when outside competition has become effective, notwithstanding the efforts of the association to cripple the competitor, the goods have fallen to one-half or one-third their former price. Neither have they hesitated to destroy outside competition by attacking a special industry by cutting down the price to a minimum profit. To show how severely this association bears on the dealer or manufacturer outside of it, it is only necessary to state an illustration: A large manufacturer of gold-foil found he could not sell his gold in large quantities unless he connected himself with the Dental Trade Association. He therefore yielded to the inducement.

He had a customer outside the association to whom he had been making annual sales of nearly ten thousand dollars' worth of gold. When this customer made afterwards an order, the manufacturer was most regretfully obliged to answer that under the rules of the association he was required to refuse the order. This relation I had in the language of the retail dealer, with the copies of the correspondence.

Here is an abuse of trade, where it were well wished we had some of the courage of the recently deceased editor and manager of the London *Lancet*, who for many years carried on a combat against those who abused the calling of medicine, and who, attacked on all sides, came out triumphant at last, clearing the atmosphere about the practice of medicine from the degrading impositions and influences which had lowered it.

It requires no argument to show that the Dental Trade Association is an injury to every man practising dentistry. It means that the prices of the manufactured article he uses, from the dental

chair to the barbed broach, are much higher than if there existed free competition. It also is an impediment to breaking down the evils of the patent system in dentistry, and supports the procurement and maintenance by their members of questionable patent claims.

There is little hope of the journals connected with the members of this association raising hand or using word to help check the degeneration of dentistry in respect to the evils complained of.

Unless the trade journals will become aroused to resist the degrading tide, professional respect will require us as a body to defend and conserve the interests of the so-called independent journals whenever they appear and wherever they have any footing.

It will then remain for the members of the dental profession who are sensitive to the above-stated abuses to establish and support journals independent of trade influences and which will stand firm for its higher and lasting interests.

The correct development of the dental profession in those matters which give it dignity and self-respectfulness requires the existence and maintenance of some journals which are above trade influences.

Such enterprises are a necessity as a controlling balance over the disturbing influences which hamper us. They also subserve the general good by stimulating better endeavor, and ultimately, if properly supported, must obtain controlling power. It should be kept in view that trade interests come and go as circumstances and fortune lead them, but the dental profession will persist and gather strength, since, like all institutions, its life will be continuous. In the long event its interest must prevail over the oppression and restrictions of personal force. We may be assured that at length the serving body cannot dominate the master power of an organized body of earnest men. This indicates that an appreciation of the necessity for the integrity of our profession, combined with love of it, like the sentiment of patriotism, will overcome all opposition.

INDEPENDENT JOURNALISM.¹

BY WILLIAM H. POTTER, D.M.D., BOSTON, MASS.

IN considering the literature of our profession which has appeared during the last ten years, the small number of published books is a matter of note. It would probably be safe to say that in the course of a given year not more than one or two books of importance have made their appearance. This lack of published books does not necessarily indicate that matters of professional interest fail to be considered, or that the results of scientific work fail to be put on record. It simply means that the profession has not yet accumulated sufficient material of an accredited sort that is worthy to assume the permanent form which a published book gives. Meanwhile, to assist the development of the profession and record its progress, a kind of literature is produced having a fresher and less rigid form than is possible with books. This form of literature is the dental journal. What is a journal? To an individual a journal is a diary which recounts all that passes during the day that is of peculiar interest to the one who keeps it. It is a record of the inner thoughts and life of the mind and soul, and a record of such passing events in the outer world as bear in a special way upon the individual. It is often the only honest and complete record which a man may make of himself. To a business concern the journal is the book in which information from all departments of the business is day by day assembled and brought into orderly arrangement and prepared for distribution into proper accounts. It reveals the intimate life of the concern; it records its income and outgo, its adjustment of losses, and its gains. With a ship, the journal is the log; it records every incident of importance in the ship's journey, from the time it leaves a port until it is safely moored at its destination. We find how important the log is to the ship when, in case of murder or mutiny upon the high seas, the log is resorted to as evidence, and its reading gives a minute recital of the intimate life of the ship. The dental journal is as intimately connected with the life of the profession as is the diary with the life of the individual, the journal of the business-house with its life and success, or the log with the progress of a sea-voyage. In order to determine under what auspices dental journals are conducted, I have addressed letters of inquiry to representative men both abroad and

¹ Read before The New York Institute of Stomatology.

at home. From Berlin I learn that the dental journals of Germany can be described as follows :

1. The principal journal is the *Deutsche Monatsschrift für Zahnheilkunde. Organ des Central-Vereins-deutscher Zahnärzte*. Edited by Parreidt. Published by Arthur Felix, in Leipsic. This is entirely independent of any dental depot.

2. *Journal für Zahnheilkunde* (weekly). Edited by Erich Richter. An independent journal.

3. *Odontologische Blätter Zahnärztliches Wochenblatt*. Edited by Albrecht. Published by the dental firm of Simonis.

4. *Zahnärztliche Rundschau*. Edited by Zahnarzt Arthur Bornstein. An independent journal.

5. The *Dental Quarterly* (in German). Published by Messrs. Ash & Sons, London.

In Austria the principal journal is the *Oesterreichisch-Ungarische Vierteljahrschrift für Zahnheilkunde*. Edited by the firm of Julius Weiss. This is a very scientific journal, and its articles are said to be in no way influenced or dependent upon the firm which publishes it.

The English journals can be summarized as follows :

1. The *Journal of the British Dental Association*. Edited by a dental surgeon who has no connection with any manufacturer. Its contents consist of an editorial article, association intelligence, original communications, legal news, reports of societies, clinical reports from hospital and private practice, correspondence, new inventions. Manufacturers take no place, except in the advertisements, for which they pay at a fixed rate. This journal is financially edited by the British Dental Association, one-third of each annual subscription of a guinea being credited to the journal account. The journal appears on the fifteenth of every month.

2. The *British Journal of Dental Science*. The oldest British journal, established in 1856 by Mr. Fox, the dentist, and continued by his partner. Published fortnightly, and having a large circulation. It is a free lance, being the organ of no learned society or manufacturer.

3. The *Transactions of the Odontological Society* is a journal entirely devoted to that society's proceedings, and is perhaps more highly scientific than the others.

4. The *Dental Record*. A monthly journal, published by the Dental Manufacturing Company.

5. The *Dental Quarterly*. Published by Messrs. Ash & Sons.

A list of the dental journals of the United States has been care-

fully compiled, and can be summarized as follows: Trade journals,—that is, journals published primarily in the interest of manufacturing concerns, and secondarily to furnish literature to dentists,—fifteen; professional journals,—that is, journals published solely in the interest of the profession,—two; doubtful journals,—journals whose backing is not apparent and which are suspected of belonging to the class of trade journals,—three.

From a consideration of the above lists, it will appear that in Germany the professional journals have a strong position and that the trade journals are of much less importance. In England we find professional journalism taking the lead over trade journalism; but in the United States we find the trade journals far outnumbering the professional journals. The points to be kept in mind in any discussion of journalism are, first, the fact that we express ourselves mainly in journals and not in books; second, that the journals record the intimate life of the professional work; and, third, that by far the larger number of journals in the United States are published under a form of paternalism, which means a divided interest.

The question naturally arises, Should we intrust that which so largely affects our welfare to the custody of those who have other things to care for besides that which concerns us?—to those who wish primarily to dispose of articles of merchandise, and who use the dental journals as a means of advertising their wares? I do not wish to be understood as speaking in a slighting way of trade journals; they constitute a method of conducting a business enterprise, and, looked at from the view of the dental dealer, they are perfectly legitimate, and in some cases are ably conducted. In the early days of the dental profession, when there was little combination among members in the form of societies, when the resources of the profession were few, it is probable that the trade journal, with its ability to supply necessary capital, conferred a benefit on the profession by recording matters of vital importance to its growth. Having once assumed this function, and having found it profitable so to do, the trade journal has accustomed the profession to a form of paternalism. The motives of the trade journal are not bad, but they are divided. There is a desire to serve our professional life, but that desire is controlled by the fundamental purpose of advertising sundry articles of merchandise to the use of dentists. It is inconceivable that in such journals anything should be published which would reflect upon the reputation or the quality of goods offered by the manufacturing house which publishes the

trade journal. To be sure, conflicts may seldom arise; but if they arise once in a score of years, that single occasion must to a scientific mind forever condemn a trade journal. What we most desire is to establish the truth, and when established to publish it to the world. If it is possible that a truth being established, its publication (because of its conflict with trade interests) is withheld by a trade journal, how humiliating to the discoverer! And yet this is what may happen at any time if we rely on trade journals,—journals representing manufacturing companies whose interests are built upon patents, and whose desire is to have as many of their own manufactured articles used as possible. Evidently we have run across a divided interest, and as money-making is the main object of every business concern, when there is a conflict between the dentist's professional well-being and the success of a manufactured article, there is little doubt as to which interest will be uppermost. After all, one reason why we so readily allow our journalism to be managed for us is because it is so comfortable to be taken care of. In our southern country years ago it is probable that slavery in its best form was not altogether unpleasant to the slave; a kind master looked out very carefully for his welfare, and he was happy and did not realize his bondage. A well-known historical writer says,¹ "The relations between master and slave in Virginia were so pleasant that the offer of freedom fell upon dull, uninterested ears. With light work and generous fare, the condition of the Virginia negro was a happy one. The time had not yet come when he was liable to be torn from wife and children to die of hardship in the cotton-field and rice-swamps of the far South. He was proud of his connection with his master's estate and family, and had nothing to gain by rebellion."

That to my mind represents the condition of the body of the dental profession to-day as far as journalism is concerned. They are under an agreeable and apparently advantageous bondage to the manufacturing houses. Care is taken that this bondage be not too apparent; liberty of thought and action is assured along many lines; it is only when the line which separates the interests of the profession and the interests of business is approached that a halt is called, and it is evident that there are some paths which may not be travelled in a trade journal.

It is a fair question to ask, Why should a writer upon dental subjects prefer to publish his work in a trade journal rather than

¹ John Fiske, "The American Revolution," vol. i. p. 178.

in a professional journal? As far as I can determine, the reasons are these: A trade journal, owing to its business capital, is often able to pay for its articles; a professional journal seldom can do this. Secondly, a trade journal, if it does not pay directly for articles, may offer to illustrate them to the satisfaction of the author and without expense. This is a great inducement, and one which the professional journal may be unable to offer. Thirdly, a trade journal may be able to give an article a wider circulation than a professional journal. These three reasons why many prefer a trade journal for the publication of their articles, are strong ones; they appeal to a writer's pocket and to his self-importance or vanity.

It takes a good deal of courage for one to give time and perhaps money to the preparation of an article, and then have it appear without suitable illustrations, and in a journal which, though it may have a good circulation, does not have the circulation which a trade journal may control. I am reminded in this connection of the action of the Harvard Odontological Society some ten years ago, when it first decided to publish its transactions. Its first thought was to find a thoroughly professional journal in which work could be published. It passed by all trade journals which would have been glad to have taken its proceedings, and have furnished ample illustrations and lightened many of the burdens of publication. It hired and paid for its own stenographer, and found a journal published west of the Mississippi whose circulation was known to be meagre, but which was a strictly professional journal. And in this journal it published all its transactions for a year or more. The Harvard Odontological Society is composed of graduates of the Harvard Dental School, and has always been an important society. Its members practically bind themselves to take their turn by lot in supplying papers. Now, this society, notwithstanding the importance and variety of its work, was more interested that the record of its work should be made in a thoroughly professional journal than that the record should be expensively illustrated or should have the maximum circulation.

It was deemed inconsistent that a society composed of graduates from an ancient university should express itself except according to methods prevalent in other departments of the university. Who would think of looking in an electrical supply manufacturing journal for published results of work done in one of the great electrical laboratories of the university? And why, then, should the Harvard Odontological Society make use of a trade journal as its organ? Considerations of this sort, which naturally occur to men in contact

with the methods of scientific men, led the Harvard Odontological Society to select the remote and in many ways unimportant journal for its use. Later, when a more important professional journal was started nearer home, the society transferred its proceedings to its columns.

Let the spirit which this society has shown be more common, let individuals refuse to publish their papers in any journal except a professional one, and the prosperity of the professional journals will be assured. They will then be able to offer satisfactory illustrations, pay for articles, and provide the maximum circulation. It is common to hear men say, "Let both kinds of journals exist. Whichever is the better journal, I will subscribe for and use for my articles. If the professional journal does not equal the trade journal, it must take the consequences in diminished circulation." All this is said with the air of one who feels not the slightest responsibility whether one kind of journal or another flourishes.

There is rarely a disposition shown to make a personal sacrifice for the purpose of strengthening the hands of those who are laboring to publish the records of the profession solely for its own interests and free from commercial complications. Little account is taken of the fact that it is difficult for a journal without capital to compete in many ways with one which has. That only by enthusiastic support can the professional journal be what all desire it to be. This enthusiastic support may be made to more than atone for large capital.

The action of the British Dental Association (referred to above) in setting aside one-third of its annual fee for the expense of the publication of the *Journal of the British Dental Association* cannot be too highly commended. In this way a journal can be placed upon a substantial financial basis, and thus be free from the temptation to bid for pecuniary success at the expense of principle. Why would it not be possible for some of our American societies to contribute a fixed part of the annual dues for the purpose of putting on a firm financial basis a journal of which we approve? Professional journalism can only be advanced by the development of a thorough professional spirit. Trade journals can only appeal to one whose professional sense is lowered by the spirit of trade. The strength of trade journals is in inverse proportion to the strength of the profession.

PROFESSIONAL ATMOSPHERE AND MORALS.¹

BY B. HOLLY SMITH, M.D., D.D.S., BALTIMORE, MD.

THE American people are engaged to-day in a struggle undertaken at great sacrifice with a certain enormous expenditure of money and a probably appalling destruction of human life, yet undertaken with cheerful enthusiasm because it is in the interest of humanity.

It took many years of shocking barbarism at their very doors to force the United States to take this view of the situation, for we are a long-suffering people, patient to endure and hard to arouse. Besides, we are a very busy people. We have devoted our energies to the development of our material interests, and the accumulation of enormous fortunes with such immense success that no other interest has seemed to have any permanent attraction for us.

We have, in many and flagrant instances, suffered misgovernment and corruption, imposition and fraud, insolence and quackery, because we have been too busy to correct and punish them. Such is the interest displayed in the amassing of large fortunes, such the influence and respect of wealth, that to strangers' eyes we have appeared a sordid and materialistic people, absorbed in ignoble occupations, sunk in the greed of gain, too low to feel the aspirations of noble spirits, or to chivalrously resent insult and contumely, or to extend the helping hand of pity and love to an oppressed and down-trodden people. Foreigners, looking but at the surface, gazed with wonder at our enormous activity, seemed to see with surprise its only end, and summarized what they deemed our national characteristic in the contemptuous phrase, "A nation of shop-keepers."

Have we been to blame in this respect? Has not the impression which epitomized itself in these terms of contempt and low estimation some rational grounds for its making? And do we not need as a nation to regard wealth more as a means and less as an end? These are questions for statesmen and moralists, but their proper answer is brought home to every one of us in his peculiar vocation.

There is an excuse, and one which very nearly palliates and condones the offence, for the man or for the class of men whose lives have been devoted to the absorbing cares, the fierce competitions of business, to regard everything from a mercantile point of

¹ Read before The New York Institute of Stomatology.

view, to judge and decide all questions according to the standard of profit and loss.

We pardon the ferocity and cruelty of the soldier in the heat of the engagement, and we overlook the calculation and sordidness of the merchant in the fierce competition of trade. To the one all the kinder impulses are for the moment overwhelmed in the desire for conquest, in the other all humane considerations disappear in the lust for gain. We dismiss the barbarity of the first by saying, "This is war," and we overlook the inhumanity of the second by saying, "This is business."

But the question which concerns us more nearly at the present time is, To what extent have the so-called business principles penetrated what we have been accustomed to regard as the liberal callings, the professions, in American life? How seriously has the infection of mercantilism contaminated the professional atmosphere? For we hold that in the light of the professions' noble history, and by the lessons of those honored traditions which epitomize that history's teaching, and under the guidance of that spirit which informs and elevates professional life, the professional attitude and the mercantile attitude towards the world are entirely different and distinct. For the elemental and basic principle of mercantile life is annihilating competition; its successful and logical development is monopoly, and its successful and logical result is oppression.

One of the greatest misfortunes of mercantile occupations is that the man with the lowest moral tone, devoid of benevolent impulses and lacking humanitarian ideas, is able to set the standard for the entire class. For he who cheapens production, and in cheapening production, as one factor of the operation, lowers the standard of living among his employees, can undersell his more humane and benevolent rival, who must either follow the pernicious example or suffer a crushing mercantile defeat from which there is no revival.

The history of great mercantile successes is replete with incidents to verify this statement, and in all important details could have been foretold from a knowledge of the principles upon which these successes are based.

The fact that suffering and oppression are not the aim, but the unregarded incidents of these successes, mitigates in no degree the cold and cynical selfishness of the mercantile atmosphere. This is necessarily an atmosphere of selfishness, and neither logic nor common sense permits us to apply the terms selfish and unselfish to the same class of actions. Nor do the many examples of philanthropy performed by those who have acquired wealth confute the fact that

these hard, unfeeling, inhuman conditions necessarily obtain in the practice of that wealth's acquisition.

We scorn to impute to these philanthropists either concession to outraged consciences or unworthy desires for enduring monuments, and we will credit them with having become wealthy in honorable business ways, and yet we will assert that the controlling principle of business life and methods is intelligent and calculating selfishness.

The question that naturally arises is, Do we of the liberal professions claim no higher motive? If we do not, then I do not conceive that we can do better than to adopt and practise these twentieth century shop-keepers' methods.

In that event our talents, our acquired abilities, our inherited learning, the wisdom which generations of self-sacrificing predecessors have placed at our disposal, are but factors and elements in the great task of personal aggrandizement, and must be used as means of our personal profit. Above all, our reputations are salable articles, to be purchased by the highest bidder for the greatest cash consideration.

Any additions which may be made to the large knowledge or more facile practice of our profession are primarily ours, and incidentally the profession's, provided they pay us well for it, and as for humanity,—suffering humanity,—the same course is open to them, and business rivalry may do much for them by cheapening the inventions of competing inventors.

In this cheerful view of our rights and privileges, the title of honor is but the right of advertising, the diploma, the license to compete with other tradesmen in specific merchandise, and it is but a short step to drummers or travelling salesmen.

Traditions of so-called honorable and established practice are proscriptive and restrictive incidents of limited business areas and old-fogy methods, to be eliminated in this progressive age. But are we ready to go into business on these terms or with these methods? Are we prepared to relinquish a professional standing, and to appeal to the world as a business organization? Do we believe that the world holds the liberal professions less in honor or esteem to-day than before? If this be true, and I for one am prepared most fervently to doubt and to deny it, where does the fault lie? With us or with the world?

Of one thing we must be assured, the world cannot take us more seriously than we take ourselves; it will not rate us above our own estimate. If what we assume as our profession is a purchasable

commodity, it will buy it as such and will not once resent the fact that we cheapen ourselves.

Gentlemen who resent the introduction of what they call sentiment into the practical affairs of our professional life have several things to consider, possibly some things to learn.

It is unfair, if the traditions of dentistry *are* unsettled, to sweep aside, unargued and unanswered, the conscientious convictions of thoughtful and earnest men, provided we are to adopt, although it be but tacitly, a body of principles upon which our conduct as a profession is based.

It is ungenerous to dismiss considerations which, though they may discriminate against the individual, are, nevertheless, for the general good.

It is unwise to refuse to weigh carefully the advantages and disadvantages of any line of action, however seductive the profitable results which it promises may appear, or to decide questions fraught with grave consequences upon the semblance of a present profit.

We have been accustomed in the past to associate the words *honor* and *dignity* with professional life, and to attach to them when so associated a peculiar significance. We have certainly implied their presence and their union in the term *professional*, and have branded their absence or their disgrace by the term *unprofessional*.

If these terms retain the sacred meaning hitherto accepted and understood by all, I submit that it would be the height of folly for dentistry to dismiss them from its vocabulary, or to connive at actions within the profession to which they cannot be fully and truly applied. If they have lost their significance, then, in Heaven's name, let us adopt some words which mean what they used to mean.

Do we need here, and at this time, to state again for the benefit of our practical friends our firm and abiding conviction that dentistry is a profession and a liberal profession? I sincerely believe that the most cynical among them will spare us this humiliation, that they must, if from no other cause, from very shame concede us that vantage point. If they do not, we can have no common ground of debate, for it is beneath my poor power to strengthen the arguments already advanced on that point, and I shall not attempt it.

But the objection may be urged that the liberal training, the exceptional skill, and complete devotion necessary to make a dentist, while they may establish dentistry as a profession, are not to

be urged as arguments against the dentist's right to use as his own private property his ability, his talents, his reputation, the results of that training, skill, and devotion.

It is in opposition to this position, stated, I think, with perfect fairness, that I desire as a dentist to utter my most respectful and emphatic protest. I crave my brother's forgiveness if this is any attack upon his personal rights, but I justify my protest on the ground that it is to his action as a professional man, and not as an individual, that I take exception. And even with that justification I would hesitate did I not feel convinced that the weight of wisdom and experience in the profession approve. For I believe, though we may frequently lose sight of the fact, that our sober thought must convince us that every liberal profession has a solemn duty and responsibility, first to humanity, and second to its own membership.

This is no new creed, but is the strongly stated conviction of the sages and philosophers of generations. To its true believers has been given the supreme glory of extending the empire of knowledge, truth, and happiness. Their sacrifices of life, fortune, and talent have ripened for us into a harvest of knowledge, skill, and power, and their spirits cry out against the abuse of this sacred inheritance.

As one of the first successful specializations of the great medical and surgical art, medicine, the attitude of dentistry towards humanity is that of a healer—a benefactor. Its mission is to alleviate suffering and to increase the aggregate of human happiness by reducing the sum of human misery. Based on scientific knowledge, through physical means, it deals with vital forces, and helps to supply the healthy body without which the moral and spiritual tone of individuals and communities is inevitably lowered. Its practice has in view the conservation of vitality, the preservation of health, the prolongation of life.

The duty of dentists to the profession is the logical corollary of the profession's duty to humanity. To fellow-members of the same learned and liberal brotherhood, do we not owe mutual helpfulness, that the effectiveness of our profession may be extended and increased?

For the same and for the good of the profession, that the body of its knowledge be widened, that the skill of its practice be improved, that the sum of its benefactions be enlarged, does not a liberal and humane policy dictate a brotherly sharing of the results of individual investigation?

It appears to me that such must be our conclusion, if we realize and appreciate the responsibility of our duty to mankind and to one another. And it certainly seems to me that all reputable and honorable traditions of medicines ought to obtain in their fullest force and effect in dentistry.

This much for convictions which have become fixed with some firmness in my own mind, and which I hope and believe are shared by many of my professional brethren.

What is the practical effect upon us as a profession, and how does it react upon individuals if we ignore a professional standard of conduct and set up the mercantile motto *laissez faire* as our guide and rule? To some favored individuals the result would be temporarily advantageous, no doubt, but to the profession at large, and eventually to the individual members, it would be a distinct disadvantage. We think we can give a proof of this proposition sufficiently convincing to the fair-minded to turn the chief arguments relied on by the opposition directly against them.

We believe it can be safely asserted that just as soon as personal advantage is set up as the supreme standard of human conduct, the taint of insincerity will be imputed, as affecting judgment and consequent action, discrediting and cheapening both. In other words, if you are for sale, and I know you are for sale to the highest bidder, and you deal in an intangible something of which I am not a judge, how do I know you are not selling something you do not possess, a knowledge you do not have, a skill of which you are not master, simply because the assertion that you do have them will bring you a price? When you have brought the public to that point, you have cheapened and discredited all assertions of professional skill and knowledge, provided such assertions are sold.

An actress or a divine says, over her or his signature, that a certain soap possesses superb cleansing qualities. This, well put forward in illustrations and placards, is a good advertisement for the soap, but not for the actress or the divine or for their professions.

A man with fierce moustache and haughty military bearing stalks between the placards bearing the announcement, "I use Get-there's Sovereign Panacea." We may be forced to note the name of the medicine, but how do we regard the unfortunate man?—or the class of men thus honestly employed? And what professional reputation in the world could stand the shock of the humiliation and degradation of such an attitude?

Is it not as clear as the noon-day sun that such a sale of a professional opinion, while it may doubtless be excellent advertising,

humiliates, belittles, and degrades the professional reputation, whether of the individual or the class?

While the world wags, we must judge the action by the motive.

The humblest speaker who delivers his message from the heartfelt sense of duty carries more weight than the most learned and flowery orator preaching for pay.

I am aware that the contention that an unprofessional use of professional skill, ability, or reputation is impolitic, and should for that reason be abandoned, is open to serious criticism. It abandons the right or wrong of the question and appeals to policy. But I use this argument of disadvantage simply to offset the argument of personal advantage, not as the ground of my opposition.

Call me sentimentalist, idealist, theorist, or what you may, I am content to rest my claims for a strictly professional use of professional advantages upon time-honored traditions, founded upon the discrimination which generations of thinkers have established between the professional and the mercantile attitude towards mankind and towards each other.

If this position be narrow and unprogressive, I nevertheless rejoice in it, for I believe it is right.

Abstracts and Translations.

THE RELATIVE EFFICIENCY OF VARIOUS ANÆSTHETICS.

THE *British Medical Journal* of November 20, 1897, speaks editorially of Waller's paper on anæsthetics,¹ in which he discusses the relative advantages of ether and chloroform. Dr. Waller's experiments have convinced him that the most satisfactory way of testing the efficiency of anæsthetics is to employ freshly prepared nerves, and to cause them to respond to electrical stimuli while subjected to various narcotizing vapors. The method is as beautiful as it is original. Not only is he enabled thus to investigate the anæsthesia produced, or, as he terms it, "temporary immobilization," but to ascertain the strength of vapor which kills the nerve and produces "permanent immobilization." Under ordinary physi-

¹ Published in the *British Medical Journal* of same date.

ological conditions the galvanometer reveals the presence of currents in the nerves. The action of narcotics is to send the nerve to sleep, and the absence of the current is proof positive of this anæsthetic sleep. Remove the vapor and the nerve recovers itself, and again the nerve currents appear. Now, by testing a number of substances, Dr. Waller has found that while all those which produce anæsthesia also bring about death of the nerve, some are far more deadly than others. Richardson, in his lectures on narcotic vapors, was disposed to regard the chemical and physical properties of narcotics as affording no criteria of their power of anæsthetics, but his methods lacked the precision of those now under consideration. The heart is capricious because it is a compound organ with a nerve factor, a muscular factor, and a nerve-cell factor. Dealing with isolated nerve the problem becomes immeasurably simpler, and at the same time the experiments can be kept absolutely under test conditions.

We have hitherto been assured that chloroform killed either by paralyzing respiration through the nervous system, leaving the other tissues severely alone, or brought about death through circulatory failure, due, it may be, to vasomotor dilatation, or through incapacitating the heart. Now we learn that not only does chloroform destroy muscular tissue and narcotize the nervous centres through its influence on the blood, but actually attacks nerve fibrillæ, and destroys their irritability. It is a matter of indifference to "the man in the street," as Dr. Waller points out, whether he is killed through his heart failing or by asphyxia; what interests him most is how he can be saved pain with as little chance of losing his life as his surgeon can conveniently arrange. From this point of view it is somewhat startling to find that dose for dose chloroform is seven times more deadly than ether when tried upon the isolated nerve,—that is, upon a highly specialized protoplasm. And what appeals most to the practical man is that these figures show how narrow a margin in the case of chloroform there is between a non-lethal and a lethal dose, while seven times that margin exists when ether is in use. The specific action of nitrous oxide has been asserted by some, but denied by Wood and Cerna and the late Sir George Johnson. Dr. Kemp's careful study confirms the former view, but according to Dr. Waller it is an anæsthetic which has little or no action on nervous tissue. Carbonic dioxide, which Snow and Richardson lauded as an anæsthetic, is, Dr. Waller finds, a powerful agent to produce "immobilization," thus confirming the assumption of the older observers. But a fact of extreme interest,

because unless carefully explained liable to fatal misunderstanding, is Dr. Waller's observation that the presence of carbon dioxide favors anæsthesia and lessens its risk. The combination of chloroform and carbonic oxide is not, it must be distinctly understood, simply chloroform given with very little air. This distinction is made very plain by Dr. Waller himself.

Accepting nerve-tissue as a criterion of the vitality of the constituents of the body, these experiments are very striking, and reveal in a clearer light the profoundly powerful character of chloroform.

In the statistics of deaths under these two anæsthetics ether stands better than the proportion of seven to one. The proportion in its favor is about thirteen to one; but, as Dr. Waller pointed out, the problem of the action of narcotics on the whole organism, although exemplified tersely by a nerve experiment, is in itself far more complex. It is often stated that the after-effects of ether are far more fatal than those due to chloroform; but no foundation in experiment or statistics exists to prove this, and, as Dr. Waller cogently puts it, the use of chloroform, if it be dangerous under all circumstances, is, unless under exceptional circumstances, unjustifiable; and if it is only dangerous when unskilfully given, its deaths amount to homicide. This is Dr. Waller's chloroform dilemma.

The discussion, in which Professor Richet, Dr. Lawrie, Dr. Shore, Professor Gaskell, and Professor Stewart took part, turned mainly upon the oft-debated evidence afforded by cross circulation experiments, as to whether or not the fall of blood-pressure incident to chloroform narcosis is brought about through depression of the vasomotor centre or through weakening of the heart itself. How far such experiments can be accepted as conclusive remains to be seen in the face of so much evidence which has now been accumulated by the researches of MacWilliam, Hare and Thornton, Leonard Hill, and others; it is difficult to exclude the vasomotor centre as in some way causative of the fall of blood-pressure under chloroform. The practical fact which stands out in terrible distinction is that deaths under chloroform have not lessened in spite of physiology or Hyderabad Commissions. It is useless to contend that these deaths arise because the physiologists teach dangerous tenets, since the large percentage of persons who give chloroform know little of and probably care less for physiology. It is rather the careless and the over-confident in whose hands such accidents happen, while, as a rule, it is safer in those of persons who have leisure and training to follow the trend of modern thought and teaching concerning anæsthetics.—*The Therapeutic Gazette.*

Reports of Society Meetings.

THE NEW YORK INSTITUTE OF STOMATOLOGY.

A REGULAR meeting of the Institute was held on the afternoon and evening of Tuesday, May 3, 1898, at the Windsor Hotel, Fifth Avenue and Forty-sixth Street, the President, Dr. E. A. Bogue, in the chair.

AFTERNOON SESSION.

The President.—It is with great pleasure that I welcome the gentlemen who are our guests to the discussion of two subjects which are of importance to us all. The subject chosen for this session is "Journalism," while we will turn our attention this evening to the subject, "Secrets and Patents." I take pleasure in presenting Dr. Wm. H. Potter, of Boston, who will read a paper on "Independent Journalism."

(For Dr. Potter's paper, see page 433.)

The President.—We have heard Dr. Potter's paper, which I am sure we all appreciate. Before asking for Dr. Jack's paper it would seem best to place Dr. Potter's views before the meeting for discussion.

Dr. J. B. Rich.—I think the position taken by Dr. Potter is one that ought to be evident to every one, that before we can have an independent journal, entirely devoted to the interests of our profession, it will need to be separated from the control of manufacturers. That sentiment in the paper is one that everybody ought to respond to. It seems to me absolutely impossible to have an independent journal so long as it is connected with a manufacturing house, and we cannot have a journal that will be thoroughly creditable to the profession until all such interests are eliminated from it.

Dr. H. C. Meriam.—It is evident that we are not to be much longer content with a condition of journalism that results in the isolation of dentistry from the other specialties of medicine, and that a journal devoted to its interests should bring to it everything from every source in modern progress in any way related to it. Some years ago a friend wrote me for material I had gathered in working for a society in Massachusetts, and I sent him all I had. He read his paper at one of the large meetings in New York, but in the report of that society's proceedings in a trade journal, that

paper was reduced to a single paragraph. Now what could have been the influence of such a proceeding, not merely upon the gentleman who prepared the paper, but on the society that submitted to the editing, and what is the influence on the profession of continued submission to such journalism? How long is this to continue? How can it be helped? Certainly not by agreements in counting-rooms. The way is the way in harmony with our American free institutions.

How can a practitioner hobbled by contract with dealers aid us? He is not a free man; when he comes to our meetings or takes part in the discussions relating to professional life, we find that he is hobbled, that in our counsels he is another man's man. Thus we have the second effect of these journals.

The American Academy of Science is aided by the national government, and in its turn is expected to give aid to the government when information on scientific subjects is needed. Some years ago, I am informed, an inventor of world-wide fame was proposed for membership; but it was pointed out that he was in the pay of large business interests, and that he could not be expected to speak freely on subjects which might injure him or the parties to whom he was under contract financially. Nor could he be expected to give information when he was under contract to sell all he might discover to certain companies.

Dr. Jacob L. Williams.—While Dr. Potter was reading his address, I was reminded of a little experience I had some time ago at a meeting, at which I made some remarks quite condemnatory of the practice so general among the so-called parlor dentists, of sacrificing the teeth for the sake of crowning, bridging, etc., which remarks were forcibly seconded by a distinguished Western member. A reporter of a trade journal was present, who was very careful to pick out interesting points to be printed in that journal; but when the journal came out there were none of the condemnatory remarks in the report in regard to that practice. I wanted to trace the thing, and, having some fancy for investigation generally, I made inquiries to find out what proportion of the trade in dental supplies artificial work bore to that relating more particularly to operative work. I was informed, after the matter had been canvassed a little, and I think reliably, that a little less than three-quarters of the trade consisted in what contributed to artificial work. That explained clearly the reason why these remarks regarding the destruction of natural teeth were not considered conducive to the prosperity of the trade. So it is not ourselves

only who are interested as a profession, but it is also the public for whom we labor. Our object is to help the public welfare in the best possible way, and it strikes the public through us; if these warnings of injuries are suppressed in such a journal, that journal is not strictly a professional journal.

The President.—Will Dr. Ottolengui favor us with his views on this important question?

Dr. R. Ottolengui.—Now that I am invited to speak, I must base my remarks upon my practical experience, and not as it seems to me the essayist and those who have come into the discussion have done, from what may be called a high, professional, theoretical, millennial stand-point. In the first place, what constitutes the profession of dentistry? Is it the members of the dental societies, or is it the members only of those dental societies who live up to a high code of ethics? There are about twenty-five thousand dentists in this country; there are, I think, less than twenty-five hundred who are members of dental societies, and I believe there are less than a thousand who have reached the standard of the Harvard Odontological Society, where each man would be either willing or capable of furnishing a paper once a year.

Now, let us suppose that there be a truly professional journal, and that it caters to this elect section of the profession, how much useful work will it do in the world? What proportion of its work would reach the patients through the hands of those who read this magazine? I think a very small percentage. It seems to me that the purpose of the dental journal has not been fully set forth; let us consider for a moment the other ninety per cent. of dentists who are not endeavoring to elevate the profession, or to raise the standard of ethics, but rather to get enough food with which to feed their children. Many men hurry away to a college, very frequently ill fitted even for matriculation, but they get in as best they can, and they get out with as little study as they are compelled to devote to their science; then they are passed by a State board of examiners, and, I may say, "turned loose" upon the community. It is an interesting fact that whereas not more than ten per cent. of the profession generally are members of dental societies, and that only ten per cent. of that number take an active part in the work and management of the societies, that one-half of all the dentists in this country take at least one dental journal. Why? Because all the young men, when they begin practice, discover how much time they have wasted by not studying while they were at college, and it becomes essential to them to find some

means of learning more about the practical work of their profession. Will they find it in that highly scientific, millennial journal which has been described, or in that magazine which is managed with sufficient capital so that if some intricate piece of mechanism is to be described, it can be illustrated so that he can comprehend it? Do the members of the Institute think they can to-day start a wave over this country which will support a dental magazine and reach the standard which has been set by some of the so-called trade journals, when it is a certain fact that it will be reached only by a loss of from ten thousand to eighteen thousand dollars per annum? I do not think that our ambitious professional spirit will carry us so deeply into our pockets. And that is the reason why the trade journal has succeeded rather than the other. What has done the work for us, if not the trade journal? Why should we be forever bantering the trade houses that have given us the finest scientific literature in the world? It is not only in dentistry that scientific magazines are difficult to support. I belong to another body of scientists in this city, the entomological; they manage a magazine at an expense to the members of the society, who share the deficit annually; it does not depend upon any trade house, and therefore the cost falls on the society.

Is it true, this constantly recurring statement, that the trade journal sifts everything that comes to its pages in the interests of the owner of the magazine? Long before I was connected with a magazine, I was intimately acquainted with the working of the *Dental Cosmos*. I never found that the editor of that magazine was hampered in any way by the trade house which paid him his salary. If we look around among the editors of this country, who are they? Are they tradesmen, or are they men whom the dental world honors? We have in Buffalo a man who is at the head of a dental college running the magazine of a trade house. In Chicago another man who is respected by the profession manages a magazine owned by a trade house; and our most important magazine is managed by an editor who is the dean of one of the largest university schools in the country. Now, is it fair to these men to suppose that they are controlled by the paltry salaries which they receive, and that they will weed out that which is against the interests of the trade house, even though it be in the interests of the profession? I do not believe that; I have never had a line eliminated from anything that I have written, and it has been not at all infrequent that I have recommended things that were in exact opposition to the interests of the house which published my papers.

Now, the matter of illustrations is not as small as may be imagined. Probably all will admit that the highest scientific class of literature that comes into our magazines is such work as Williams, Andrews, Black, and other histologists have given us in the past, and it would be absolutely unintelligible without illustrations. What would we know of the work these men have done if it had been buried in a little professional magazine whose capital was so small that what these men saw under the microscope could only be given to us by words. I am reminded of the old adage that we should not throw away the stick which has supported us until we are certain that we can get better crutches.

The President.—Having heard from both sides in reference to Dr. Potter's paper, we will now give our attention to Dr. Louis Jack, of Philadelphia, who will address us upon the subject, "What should be the Character and Policy of Dental Journalism?"

(For Dr. Jack's paper, see p. 426.)

The President.—We have heard Dr. Jack's paper, which is on somewhat different lines from Dr. Potter's, and I hope it will be discussed as it deserves to be.

Dr. Wilbur F. Litch.—I have been much impressed by the papers which Dr. Potter and Dr. Jack have read and by the arguments that have been brought forward as to the desirableness of having at least one dental journal in America strictly professional in character, published by men who love truth for the truth's sake, and dentistry for dentistry's own sake,—a journal unbiassed by partisanship and untrammelled by trade interests.

This, as Dr. Ottolengui says, may be a millennial conception, but there must be a beginning to all things, and we have a good beginning in the INTERNATIONAL DENTAL JOURNAL. It is edited with great ability and with absolute dignity of tone, and is in many respects, and to the full extent of its all too scanty pecuniary resources, a model journal. I do not doubt that if it could receive from the dental profession at large that measure of support to which it is entitled it would easily equal, if not surpass, any other dental journal now published.

I say this in no spirit of detraction as to the merits of dental journals published by business houses primarily for business purposes. One of the oldest, perhaps the oldest, of these, the *Dental Cosmos*, has, as we all know, done and is doing magnificent work for dental literature; in the number and value of its illustrations, in the amount of compensation which it pays to its contributors for original work, no strictly independent or professional journal can

hope to rival it until at least a far more liberal amount of money is appropriated for that purpose than at present appears possible.

The publication of valuable papers in a journal having a very limited circulation is, as Dr. Potter has very well shown, attended with a good deal of disadvantage, not only to the individual who is seeking a reputation, but to the profession, if they are to be benefited. Almost any man would hesitate, unless he were of a very self-sacrificing character, to spend a great deal of time in original work and have it buried in some obscure journal where it would be seen by a very few people. The matter of illustration is not of minor importance, as Dr. Ottolengui has shown. Not only in the domain of histology, but in the domain of practical operative procedure, illustration is indispensable to clearness of description. Words at best are a lame mode of communicating thought, and when we want to get a tangible thing clearly in the mind of the average man we can best do it by drawing a picture for him.

If, then, we are to have a journal that is not only representative of the profession, but which will benefit the profession, there must be devised a system by which adequate pecuniary resources may be placed at its command. We have an example of what a professional journal may be made by systematic effort in the *Journal of the American Medical Association*. Every member of that association who has paid his annual dues, five dollars, is entitled to receive a copy of this journal free. It is published weekly, and, in addition to the papers read at the annual meetings of the association, contains a large amount of other interesting matter. Some such method as this will be necessary if we are to have a professional journal adequately supported. With the merging of the American and Southern into the National Association the membership should be very largely increased, and if, under the auspices of that Association, a journal were established on the lines of the *Journal of the American Medical Association*, it would give us, I think, what we need.

As to trade journals, I am fully persuaded with Dr. Ottolengui that the publishers very rarely, if ever, interfere with the work of the editorial department, and can hardly think it possible that a contribution would be rejected or changed simply because it happened to recommend a rival process or the product of a rival house. Where larger matters are concerned, however, there seems to be reason to believe that in some cases there has been interference in a direction antagonistic to professional interests.

Dr. Rich.—I have very little to say concerning the subject of

journalism. My belief is that until the members of the dental profession make up their minds to put their hands in their pockets and pay for a good journal they will never have it. The first effort to establish a journal in this country was the *American Journal of Dental Science*, and I assisted in making up the first subscription list. We had about enough subscribed to publish that journal, without paying the editor anything for his labor, but more than half of those who subscribed did not pay, so that we were not able to get the journal out the second year. I apprehend that that will be the way with any dental journal without proper backing, unless the dentists become more liberal in their efforts to promote it than experience has shown them to have been. There are very few dentists but would say that we ought to have a journal of our own and be free from trade-journalism, but there are many difficulties in the way. The proprietor of a trade journal told me that he had paid high prices for articles from the pen of a member of our profession who would not otherwise have been able to give the necessary time to make the investigations and make a record of the results. The articles referred to are admitted by all to be of the greatest value, and the methods of trade-journalism have in this way contributed greatly to the advancement of the profession.

I am sorry to have to differ with my friend Dr. Jack upon the subject of dental patents, but I do think that it is a very short-sighted policy to deprecate the taking out of patents. I want to know how many of those very valuable aids to our profession would have been on the market to-day if the dentist had not been paid for the labor of originating and perfecting them. It has been announced as reprehensible for a dentist to take out a patent. Now, we would not have had an improved dental chair nor a dental engine, nor hundreds of other things, if the people who had invented them had not been encouraged to take out patents to protect their rights. There is one strong argument in this matter which perhaps those present do not remember. There was a gentleman living in San Francisco who invented a remarkable set of clamps, forty or fifty in number, which he brought to this city and patented. I saw them, and I can say that they were the most valuable set of clamps I have ever seen,—so valuable that when I found they could not be manufactured I offered him one hundred dollars for his set, which he refused. This man applied to Mr. S. S. White to sell the patent, and Mr. White was disposed to give him a very liberal price for it, until, submitting the matter to his attorney, it was found that the patent was not perfect, because there had been

a previous application with which this interfered. In the mean time Mr. White found that the whole set of forty could be manufactured for about two dollars, and could be supplied to dentists at a large profit, including a royalty, for about ten dollars, which would have been very cheap. But Mr. White would have nothing to do with them, as a perfect patent could not be granted, and the consequence is that the profession is deprived of the use of these valuable clamps. There are many things which are useful to the profession that would never have been heard of if the inventor could not have patented them, and I think, therefore, that dentists ought not to set themselves against patents. Members of the medical profession do not take out patents, but they write books about their methods and operations and share in the profits of the copyright.

If I spend months in perfecting an invention that is useful to the whole profession, what meanness it would be on the part of those who may use it to say, "We are much obliged to you," and proceed to use it without paying for it. We ought to do all we can to encourage the patenting of articles that will facilitate our operations, and we should be willing to pay the inventor for the use of them.

Dr. Meriam.—It seems almost unkind after this paper on "Journalism" to ask our eloquent friend what became of the clamps that were so good and that were shown to the publisher of a journal that could describe them. Is it customary for professional journals to consider ownership or title as a prerequisite before they mention new discoveries in their journals?

There was the description in the Patent Office, and a journal that was devoted to the interests of the professions could publish a copy of the patent as showing advance in dental appliances, and could inform us when the patent would expire and when we could have them made. To illustrate a new set of clamps would certainly not cost more than to prepare the illustrations for papers on other subjects. What kept back the clamps?

Dr. Rich.—This man, who had spent years in perfecting these clamps, refused to have them manufactured unless he could be compensated.

Dr. Benjamin Lord.—It is well known that I have endeavored to do what I could towards establishing dental journalism upon an independent basis.

My feeling is that we should regard the matter as one of principle and just pride,—that we should not allow ourselves to be dependent upon the journals whose paramount interest is trade for the publication of our professional contributions and the proceed-

ings of our societies. It would seem that we ought to have more sense of independence and professional dignity than to allow such a state of things to exist.

With these views and feelings, however, we need not have any jealousies or any want of respect for the so-called trade journals. They have done good work in editing and publishing important matter, and should have due credit for it; but we are well able to do our own work, and should we not have sufficient pride and self-respect to do it?

It is certainly most gratifying to hear the INTERNATIONAL DENTAL JOURNAL so highly spoken of, for it is felt by many to be one of our most useful journals. All this, as can readily be understood, has not come about without a great deal of well-directed and earnest effort, most of the work having been done by a few, of whom Dr. Louis Jack has stood in the very front and borne much the heaviest part of the care and burden. Dr. J. A. Woodward has rendered him most valuable assistance. All know of the marked ability and fidelity of the editor, Dr. James Truman, and with what hearty interest and faithfulness he has performed his part, and he well deserves our thanks and our high regard.

What the INTERNATIONAL DENTAL JOURNAL now needs is an earnest and increased support on the part of the profession, and the question may very properly be raised, should it not have this support? Should not the profession take the greatest pride in a publication that they may legitimately and properly call their own?

So much good and successful work has been done up to the present that dentists should surely feel under obligations to render the necessary support with a hearty good-will and with the view of not only increasing the number of subscribers, but of aiding in every possible way to make the INTERNATIONAL DENTAL JOURNAL the very best medium of professional and useful information.

Dr. Ottolengui.—I should like to ask Dr. Meriam a question. I think he was the presiding officer of one of our largest meetings, held in Boston, in which several States united. At that meeting a very ingenious oven for porcelain work was presented to the profession. I would like to ask Dr. Meriam what ever became of that oven. Personally I have never been able to get one like it.

Dr. Meriam.—I suppose that as the description of that oven was never given in any professional journal or book, that it is lost to the sight of the dental profession.

Dr. Ottolengui.—Anything that Dr. Meriam sends us for publication will be reproduced with pleasure and free of cost.

Dr. J. Morgan Howe.—I am pleased that the statements and arguments are not all on one side, and I am glad that such able representatives of thought, somewhat opposed to what has been presented, are here this afternoon. I think, if I may be allowed to refer to what Dr. Rich said about journals, that he is mistaken in his anticipations as to what will be accomplished. I think that he is rather too pessimistic in supposing that there never will be a very successful professional journal.

Dr. Rich.—I beg to be not misquoted. I said there never would be an able professional journal until the dentists put their hands in their pockets and paid for it.

Dr. Howe.—I stand corrected; but, in reply, I claim that there is *now* a very able professional journal; the dentists have put their hands in their pockets, and have devoted money and labor to its establishment and maintenance up to the present time. Of course, the amount of support that it has received has been totally disproportionate to these efforts; what they wish is that the amount of support it shall receive shall be more in consonance with its merit. In connection with what has been said in regard to enlarging the circulation and usefulness of a professional journal, it seems a remarkable thing for an argument concerning the support of a journal, that is published by and for a body of men claiming to be professional, to be based on its merits relative to those that are confessedly published for a divided interest, when it is within the power of the dentists to make it superior to anything there is published if they take hold of it. They stand off, each one considering whether he will give it his support,—withholding because it has not had the support they admit it ought to have from others; meanwhile, they give their contributions and other support to its competitors. If even the class of dentists who have been spoken of as numbering something like a thousand, those whose ethical principles are on the highest plane, if even so small a number as that were to give loyal support to professional journalism, without any wavering, there would be no longer a question as to superiority, not only in quality, but in circulation and strength; it would be accomplished at once.

Dr. W. H. Potter.—I am glad to see that the discussion is coming down to personal considerations. The last two speakers have indicated just where the weakness exists; it exists in this room, in New York, in Boston, Philadelphia, and Washington. If we wish to establish and maintain a professional journal, we can do it if any considerable number of men in these large cities band themselves

together for this purpose. The trouble is that we have divided interests as well as the trade journals. We wish to throw a part of our influence with the trade journals and a small remnant of it with the professional journals, and the latter do not have the support they ought to have.

I do not understand the argument that was made to the effect that the professional journal was not suited to that portion of the profession who may not be as well educated or informed as those whom we commonly meet. That seems to me inconceivable. In our professional journal we do not publish things that are entirely apart from the comprehension of those least educated; there is no reason why it should not be perfectly equipped with all kinds of professional information. It should minister to the needs of the humblest member of the profession.

Dr. Ottolengui.—I would like to speak directly to the matter just brought up. When I made the assertion that a strictly professional journal run on millennial lines would not have a wide influence, I meant this, that the field of what might be called mechanical dentistry is very large, more than one-half of the whole percentage of sales in a dental goods business coming from this source, we are informed. That being true, it indicates that a tremendous proportion of practical dentistry is done along prosthetic lines. But if we look over the list of scientists and then examine the articles that they have written in the last ten years we will find how very meagre is the proportion of literature dealing with prosthetics. I know that it takes very many letters addressed to men who are devoting themselves to prosthetic lines to obtain one paper for publication. Another difficulty will be this: Among scientists there is a great deal of what we will call self-respect; a scientist always thinks that he is before everything else a scientist, and he is very jealous of everything he writes; he does not like to have even an adjective changed. Now, it is a peculiar fact that a large number of our scientists have begun the study of science without the fundamental knowledge of English, and it is a hard and onerous duty that the editor has to perform before he can make their contributions palatable. And it is difficult for the editor to forget that a personal friend writes these things. Another trouble in getting support to a professional journal will arise from the fact that the scientists could well afford the price of a subscription to the journal, but they feel that they have attained an eminence in the profession which entitles them to be on the "free list." I met a very prominent dentist recently who made an allusion to some-

thing in my own magazine, saying, "That reminds me, why don't you send me your journal?" "Don't you get it?" I asked. He said, "No." "Have you subscribed for it?" He answered, "No; all the other editors send me their magazines." I replied, "The other editors may own their magazines; I cannot send you mine because I do not own it, and, moreover, so far as I am concerned, it goes to nobody free except to students in dental colleges who are trying to work their way up."

I fully agree that it is practicable for us to have a dental journal, and, in spite of the fact that I am championing the other side, nothing would please me more than to see our profession elevated to a plane where it would be possible to maintain its own journal. I understand that the National Association has recently appointed a committee to formulate a scheme for a magazine of its own. The thing to do is not to listen to all the arguments in favor of it, but to just go ahead and see if our thousand professional scientists will agree to pay ten dollars a year for the privilege of receiving *gratis* a magazine which is devoted exclusively to their interests. That would give the editorial department a certain working capital of ten thousand dollars to provide only one thousand copies of the magazine. Regular subscribers would furnish the balance of money needed. If the gentlemen will admit that I am one of the thousand I am willing to pay my ten dollars.

Dr. S. E. Davenport.—I desire to be placed on record, and if I say but little it will be because it is difficult for me to give expression to my thoughts on this great subject. The references which have been made to the establishment of professional journals in the past have been most interesting, but those attempts were made at the time when our profession was struggling in its infancy, when every man's hand was raised against his fellow so far as the dissemination of knowledge was concerned, and my wonder is that a professional journal could thrive as well as it did in those days. The dental specialty of medicine has made much progress during the past twenty to forty years, but in this matter of journalism it seems to me not to have kept pace with its advance in most other directions. The trade houses, which were so helpful to us and which had much to do with our progress when we were clinging to any little idea we had in place of giving it to our neighbors, were at that time really more progressive than the members of the profession, and we owe them a great deal for what they did. It seems to me now, however, that since the establishment of the dental trade combination the supply houses have confessed that trade in-

terests are to be first with them, and we ought not, therefore, to allow them to dictate the policy of our journals.

Dr. Meriam.—In addition to all other matters of a journal it should be a record of the progress of our specialty. A journal should be so conducted and so in touch not only with the improvements in our own specialty, but, where it touches the other activities of life, that it should be a record of them; it should contain not only the useful matters of the day, but should be valuable as history of our progress. We present papers at our meetings; they are valuable; they show our scientific progress; but when any question comes up relating to the history of dentistry we cannot turn to our journals. If any matter of a patent comes up, we have to go to the Patent Office. In this fight against the Rubber Company, have any of the journals come to the help of the dentist? Have we had any record from the dental journals of various things that were done in the past that have helped us to fight these suits?

Dr. Jack has done well in calling the Combination into court again. Some years ago an explanation was made regarding it, "that any reputable dealer could become a member," but it never was stated how a man became a reputable dealer. In fact, a person who wished to start could not get stock, as the Combination dealers refused to sell to them. Capable assistants or managers wishing to set up for themselves are thus kept from doing so, and though known, perhaps, by all to be honest and upright in all the relations of life, become immediately disreputable if they wish to start as dealers in our supplies.

So, in the answer to Dr. Jack, perhaps the Combination will state just how those who wish to start in dental-supply business can become reputable dealers.

Dr. G. A. Mills.—I think that Dr. Davenport has stated the point. The dental profession owes it to itself to sustain a journal of its own. I think that would mark the greatest progress. It is true that we have depended upon the trade journals too long. I cannot pay sufficient respect to the house of S. S. White for the aid which it has furnished, but there has come a time when we owe it to our self-respect to show to the world at large what we can do as a profession in regard to independent journalism. I think we could do ourselves great credit by setting an example of independence. I want to pay a tribute of respect to the INTERNATIONAL DENTAL JOURNAL. I think it a model journal as far as it has gone, and I do not know a man who has ever been connected with a dental journal more able as an editor than Professor Truman. I do think the time

has come when we should take a decided stand in regard to this matter of an independent journal.

Dr. B. Holly Smith.—I wish I dared trust myself to discuss this question in the dispassionate and logical manner of Dr. Davenport. Though I feel that it is unsafe to attempt that, it would be hardly fair to myself not to add my tribute of praise and commendation to our own journal, the INTERNATIONAL DENTAL JOURNAL, and I feel that I should like to be my very best self if I proposed to antagonize the advocates of the trade journals, especially in the presence of so able a champion as my friend Dr. Ottolengui. I think that the consensus of opinion in this audience does not require that I should take this position of antagonism. I simply say that Dr. Mills has voiced my sentiments in this, that there must and will come a time very soon when literary work shall be done by members of the profession, free and untrammelled by any association or any obligation to any business enterprise or establishment. I feel that that is the prevailing sentiment in this audience, and I congratulate you, Mr. President, and the members of this society, that here in New York that thought is foremost.

The President.—I have a letter from Dr. Beers, of Montreal, who expresses himself with the utmost enthusiasm over the idea of an independent dental journal which shall fully and freely express all that dentists have to offer, and shall unite the Canadian brethren with those of the United States, with whom at present they are most deeply sympathizing on national lines.

EVENING SESSION.

The President.—Gentlemen, we were this evening to consider the subject of "Secrets and Patents." We will first listen to a paper by Dr. Smith, of Baltimore.

Dr. B. Holly Smith.—It is probably due to this society that I should say a few words in explanation of the title of this paper, which is put down on the programme as "Professional Atmosphere and Morals." The title of the paper came into my mind without knowledge at the time that the title had been used before, but with a very distinct recollection of impressions that had been made upon my mind by a paper written several years ago by Dr. Meriam. In that paper, I think, the pace was fairly set for this discussion, and therefore I think I do Dr. Meriam no injustice if I try to follow in a feeble and ineffectual way the outline which he has indicated.

(For Dr. Smith's paper, see page 439.)

The President.—Our numbers have been augmented considerably

since we went to dinner, and so, possibly, a number of those present are not aware that we have become entangled in the question of ethics. Dr. B. Holly Smith has given us his views, and, instead of adopting the plan of this afternoon, I shall ask Dr. J. Morgan Howe to follow immediately with his paper.

(For Dr. Howe's paper, see page 413.)

The President.—We have listened with much attention to the reading of Dr. Howe's paper, which is one of a series of several papers from the dental side of the house. Two or three gentlemen from the mother profession have done us the honor to be present to participate in this discussion, and I take the liberty of asking Dr. D. B. St. John Roosa to open the discussion.

Dr. Roosa.—Mr. President and gentlemen, I say in the beginning, with no mock modesty, that I am here in the capacity of a learner, in the sense that I have never known until to-night, when I have heard these very interesting and able papers, the difficulties that surround the professional performance of the duties that belong to your specialty. I lament very much, as a member of the medical profession, that there has been any apparent or real separation of the child from the mother. I still think—although that is not a question under discussion—that we specialists—dentists, oculists, aurists, surgeons, and physicians—ought to go together on the same road up to a certain point and then branch off and become what circumstances and the providence of God make us, and advance in the special path which we have chosen. But, still, that is a question, as I have intimated, which will be ultimately settled, and I have no doubt in the right way, and we will not discuss it fully now.

I have to express a personal regret that when for seven years I was a member of the council of the University in this city I labored in vain to attach to the medical department a dental department, and I think I am violating no confidence when I say that the chief difficulty was in the constant reiteration of the medical profession—whether true or not, certainly not wholly true—that dentists did not live professional lives, and that therefore dentists must not be classed with oculists and aurists as members of the medical profession. We have advanced so far in the State of New York in the profession to which you gentlemen belong, the general profession of healing, that we have abolished a written code of ethics, and although there are a few recalcitrants who think—honestly, no doubt—that there can be no ethical propriety unless there is a book of etiquette and a book of laws, yet a vast majority of the profes-

sion in this State have upheld the medical standard higher than ever before in the history of the profession, without any written code, and they have during that time made a law which has put the State of New York, as far as admission to the medical profession is concerned, on a higher plane than any other State in the Union except Pennsylvania, which has imitated us successfully. We broke away from the written code of ethics and from the old notion that if a man believes that with a thousand-millionth of a grain of belladonna he could cure scarlatina, he does not know the anatomy and physiology of the human body. We will not quarrel with him because he believes in infinitesimal doses; in that respect we have made ourselves freer. We, without the written code, consult with whomsoever we please so long as the State of New York says that that person is a practitioner of medicine. That may not be new to you, but it is perhaps necessary for me to state it in going on to the brief discussion of the other points. Although we now have freedom in consultations and we do not subscribe to the written code of ethics of the American Medical Association in this State, we are even more ethical and truly professional than ever before.

In this matter of patents and secrets and what pertains to professional manners, the State of New York stands as high as any profession on the face of this earth, wheresoever it may be, in Continental or British Europe or in any State of this country, and far ahead of one of the most cultivated and distinguished States, Massachusetts, where quackery reigns and predominates without legal hinderance, while in New York such a thing as legalized quackery does not exist.

In this paper of Dr. Howe's, let me illustrate, if I may, one of his positions by a medical allusion. Helmholtz invented the ophthalmoscope in 1851. Now, suppose Helmholtz had patented the ophthalmoscope, just imagine the condition of things, the loss to the world. That instrument which he invented is one by which you may see the retina and retinal vessels under favorable conditions, but it was a very imperfect instrument; still it would have paralyzed all attempts to make it a perfect instrument if in the beginning it had been patented. This was a great invention by one of the greatest scientists that ever lived. Had it been patented, we should have settled down and been twenty-five to fifty years behind what we are now, because we have now gone absolutely as far as human skill can go in the perfection of the instrument, without a single patent or any attempt to restrain the ingenuity or

liberality of scientific medical observers, and the profession has certainly acquired, in the eyes of the public and the world, a reputation that it could not possibly have had if it had gotten out patents for its discoveries. Mechanics may secure patents, but no professional men. Now, that kind of thing might be continued indefinitely, and there is an illustration between the copyright and the patent. Your books are all copyrighted, but they do not restrict anybody. Suppose Downders, who brought out glasses for the relief of astigmatism, had copyrighted his book and received the money derived from copyrighting it, not to the detriment of any human being, but suppose he had patented,—and I judge he would not have had much difficulty in the United States Patent Office in securing a patent for the cylindrical glasses and the spherical glasses for the relief of astigmatism and hyperopia,—suppose that had been done, what a condition the profession would have been in so far as ophthalmoscopy is concerned! A blight would have fallen upon that part of our science which now, thanks to the unfettered labors of so many liberal-minded and scientific men, has such a healthy and luxurious growth.

Now, Mr. President and gentlemen, it seems to be a question that cannot be debated except on one side, that we as professional men must give the world the benefit of our ideas as soon as we believe they are of any use, so that we may help our fellow-men. We may put them into a book and receive a copyright for the book, we do not prevent the dissemination and full use of it; but if we patent our work, we put a gag at once upon any attempt to open the mouth of the profession on this subject. Suppose there had been a patent upon the proper method or a method for the extraction of cataract, what a position would the hospitals, the dispensaries, and the private practitioners of our profession be in to-day. Suppose there were a restriction on the operation for mastoid disease, when we have the advantage of the experience of a great many men, freely given, spread out on every medical page, suppose there had been any restriction, how much less of a surgeon would every one of us be. And thus you might go on indefinitely. The triumphs of your profession are simply enormous. Coming to the end of the last decade of a tolerably long life, as professional life goes, with a certain capacity absolutely unharmed through the care and skill of a member of your profession, I have a personal appreciation of the triumphs of that profession, which I do not think any man can succeed in over-estimating. I know what dentistry is, and I know that it is perfectly fitting that it should have a most exalted

position among the professions, and I think, Mr. President, that if you refuse to tolerate anything which we, in our profession conceive to detract from our high character before the public, from our usefulness to them, you will so much the sooner get that complete appreciation on every hand which you deserve and which has sometimes been denied you.

I am aware that I am not sufficiently acquainted with the difficulties in the dental profession, with its history, to properly and adequately discuss this question; but I certainly can express my complete and entire sympathy with what has been said by Drs. Smith and Howe. I may also express the hope that the day is not very far off when we shall be side by side in the general profession exactly as I sit down now with my fellow general practitioners, although a specialist, and receive the same treatment from them that they expect accorded to them,—in a position of perfect equality. That is what we should have, perfect equality for the dental profession with every other department of medicine and surgery. You may assume you have it, but I think not, as yet; I think you will admit that it is not fully accorded. I think the general impression is that you are to go a step or two further; that you are to completely emancipate yourself from the swaddling clothes of your infancy, when it was thought necessary to protect your great discoveries and your great advances. Here, in this country, the cradle of scientific dentistry; here, in this country, from whence go the dental surgeons that win the respect of the medical profession abroad in the highest degree, and where they are received upon perfect equality, we ought to make the foundations broad and sure, and comprehend in that great foundation a building which shall embrace us all.

I thank you, gentlemen, very much for your very patient hearing.

The President.—We are very grateful to Dr. Roosa for his part in the discussion of this subject. I think, however, that he forgot to state one important fact, that both Helmholtz and Downers during the course of their lives realized a degree of respect and consideration on the part of their brethren and the public at large that amply compensated them for their liberality towards their profession.

Dr. Roosa.—I may add that I do not think that either of them would have exchanged the position that he held in our profession for the fortune of a Vanderbilt, had it been possible to obtain it through patents, which they never secured and never tried to get.

Dr. Robert H. M. Dawbarn.—I had hardly realized until I heard these papers by Drs. Smith and Howe that there could be any discussion on such a matter in this year of grace. I did not have the pleasure of being present this afternoon and do not know what was said at that time, but it seems to me that it would be a good deal like opposing some of the propositions of the decalogue to oppose such ideas; and he must be truly archaic in his mental attitude who would wish to take the profession back to the time when secret medicines and secret methods and medical devices patented for personal profit were approved of at all.

In discussing only to-day, at the library of the Academy of Medicine, with one of the most distinguished members of the Academy the paper which I knew Dr. Howe was to read to-night, he used an illustration which I cannot refrain from giving. He told a little tale of a very modern little girl who heard her mother tell her for the first time the story of Pandora and the box of ills, and the gentleman said that the illustration reminded him somewhat of what the dental portion of our profession are now discussing. The mother was carefully going over the story, endeavoring to work up the climax, and the small daughter listened intently until the mother had reached the point when Pandora could not resist the temptation to open the box for the ills to fly out, and then the little girl broke in,—“I know what flew out! GERMS!” She was unquestionably up to date. And, gentlemen, probably in the whole box there are no germs more subtle and injurious to the profession in innumerable ways than the advertising methods and the secret devices which the more advanced members of it have to face and to fight. It is not alone in this country, it is not by any means because we are a new country, that this battle has to be fought. I often think we are farther advanced in these regards as a profession than is the profession abroad, certainly in continental Europe. I could give a dozen instances, where two will suffice, to illustrate this point. It is only a few years ago that one of the most famous pathologists in Germany, Dr. Weigert, advised, as a means of attacking tubercle bacilli, a scheme of killing them in the lungs by inhaling intensely hot air. It is well known that tubercle bacilli are easily affected adversely by a moderate increase of temperature above that of the body, and he had an arrangement for rendering the air intensely hot and permitting its inhalation from behind an asbestos shield. He patented it in Germany and brought it over here with the intention of making a lot of money out of it by having the profession take it up. He was accompanied by

strong recommendations from prominent men in Germany. After it had been used a little while here it proved a complete fizzle, and Dr. Jacobi remarked with sarcasm that it was evident that tubercle bacilli were more easily killed in Germany than here. Now, the point is, in regard to that apparatus, that not for a moment would such an attempt have been tolerated here. The inventor who thus violated his oath, taken at graduation, to give freely for the good of humanity any discovery of his, would have to a certainty been censured by a committee on ethics. Take France for a second instance. It is not over two years since Professor Fort, of Paris, came over here and demonstrated at the New York Academy of Medicine his method of cutting through a urethral stricture by an electrical device, thereby effecting a very rapid cure, and a French gentleman, a very prominent physician here in town, a most reputable member of the profession, told me that Professor Fort was very much bent on patenting that device and getting up a company in this country which was to make an enormous profit upon the cost of the instrument. And this gentleman told him that if he did so all the other French physicians in New York would denounce him and withdraw their support. Professor Fort is a member of the *École de Médecine* in Paris; so that it is plain that we in this country are not alone in our struggle for the right in these matters. A distinction must be drawn, however, between those doctors who patent for personal profit and those who do so to protect the profession and the public. I could name several instances where an ingenious surgical device has been patented by its inventor, who thereupon gave the patent freely to the profession. In this way he prevented some unscrupulous dealer from patenting and then overcharging for his (the doctor's) instrument.

By way of showing you that there is a feeling among us that physicians should always keep before their eyes the fact that they would be disapproved by the better members of their profession if they were to yield to inducements for personal profit in these matters; and to allude for a moment to the other branch of this topic,—that regarding drugs,—let me say, and those gentlemen who are members of the County Medical Society will bear me out, that the County Medical Society invitations are always printed with a standing quotation from the by-laws strongly disapproving of any member attaching his name to a recommendation of any nostrum or proprietary medicine, or anything of that kind. Let us avoid even the *appearance* of evil. Experience has shown that if the members were allowed to forget that regulation, some of them

would perhaps have occasion to be reprimanded, but by continually keeping the law and the gospel before them such a necessity may be avoided, and it seems to me that it would not be out of the way for the dental societies to take a similar step.

So fully has the matter been discussed both by the distinguished gentlemen who have just spoken and by the writers of the two papers, and so little do I wish to take the time of those who may follow,—especially as I do not feel moved by the spirit to say anything new, but merely to uphold the hands of those who are making this good fight and who have the hearty sympathy and approval of all other branches of the medical profession,—that I will conclude simply by remarking that when the chapter of true medical progress is written up I have no doubt that the page devoted to your work will show a distinct ethical advance achieved; and every man who has taken this attitude will feel proud that he has done so, since thereby he has demonstrated that he has had the true interests of our profession at heart.

Dr. Rich.—I was surprised at the contents of the two papers read this evening by gentlemen who occupy a distinguished position in our profession. Both have been benefited to a great extent by the improvements that have been made because of the patent laws in the apparatus we use, but they advise the profession to set their faces against the taking out of patents on the ground of professional etiquette. I would like to know who, among all in this room, would like to have the many things they use which have been patented taken away from them and be left to their own resources. No other one thing has assisted in the advancement of this profession so much as have the patent laws. Our method of operating has been entirely changed, our facilities for performing skilful operations have been increased a thousand-fold, and this is due in a great measure to the operation of the patent laws in stimulating improvement in the machinery and apparatus that we use. What would the men of to-day do without the dental engine? and that is not at all in the condition that it was when it was first presented to the profession; the patent laws have not prevented hundreds of improvements upon it. Look at the hand piece; the patent on it has not prevented improvements. Who will pretend to say that any person in this room would have devoted the time and energy that were required in order to arrive at the perfection which the hand piece of the engine has reached to day and give it to the profession without compensation?

See what an advantage the patent laws have been to our coun-

try. Look at the mowing machine; this was first presented in the crudest form, but the fact of its being patented did not prevent improvements upon it. That is a mistaken idea. Other illustrations are the reaping machine, the ditching machine, and the sewing machine. Look at the improvements in our dental chairs. We had at first to operate with chairs that had no movement at all; but gradually one patent upon another has been added, the obtaining of the first patent not preventing the after-improvements, and now we have a chair in which we can make the patient comfortable in any position we desire. Why should we ignore the right of the inventor to secure his invention and the profits of it?

Regarding the cases that Dr. Roosa has spoken of, I think I have already proved by my illustrations that if there had been a patent on that apparatus for examining the eye the patent would not have prevented improvements. I do not want to be understood as advocating secret nostrums or processes or the patenting of methods; I simply speak of the patenting of instruments and apparatus.

Dr. James McManus.—The subject of patents does not interest me, perhaps, as much as it ought. The Bible says, "God hath made man upright, but they have sought out many inventions."

For years I have paid money to fight invalid patents and to protect men who would not give one cent to protect themselves. I paid to fight the Vulcanite Company, and during that time I never made or had any one make for me one piece of vulcanite. I belong to the Dental Protective Association, and perhaps in the future I may continue to pay to fight patents. For years I have earnestly tried in an humble way to fight the claim to any honor of one patentee, and I had, fortunately, the majority of the dentists in the country with me.

I was amused last year at the efforts made by a dental journal in asking the dental profession to pay honor at this late day to the pioneer patentee of a secret anæsthetic nostrum.

The older gentlemen present will recall to memory "Letheon." I merely allude to this to show that patent annoyances started years ago, and they bid fair to continue. While the workers in this direction have my sympathy, I hope they will temper their enthusiasm, so that under no circumstances, as has been said by one editor, will they be liable to render the profession an object of ridicule. The business side of dentistry has been rapidly pushed to the front of late years, until now the special and attractive feature of many dental meetings is the exhibit. We may need all the new

devices and appliances and the notorious secret nostrums that agents supply in such alluring packages, and that a trade journal had offered as an inducement to increase its subscription-list, but one can hardly keep back the thought that a powerful search-light may yet be needed if we wish to pierce the foggy atmosphere that seems to be gradually settling down and enveloping dentists and dentistry. Much that is good can be said of dentistry as a trade or business, but the atmosphere of professed professional dental journalism may well give one the chills and fever; and it is unfortunate that this condition—for it is a “condition and not a theory”—is one that we cannot very well shake off. We have to thank God for a few journals that sustain a professional reputation, and they ought to have a more generous support. We have others that claim to be professional, but their pages often give evidence that their editors have no conception of what the words prudence or professional mean. It was highly professional for the editor of a trade journal recently to put forth the strong statement in reference to State officials that, “So long as they aim to fulfil their duty, they are entitled to respect, and any disrespect to them is antagonism to law itself;” but in a later issue of his journal he fell from grace when he permitted to appear letters that contained slanderous and libellous charges against five honest men, who had aimed to fulfil their duty as dentists and State officials.

Journalistic carelessness, and consequent violation of the code of ethics, was illustrated again in the recent allusion by the editor of a trade journal to the action taken by the Connecticut State Dental Association regarding advertising anæsthetic nostrums, not, as erroneously stated by the editor, *local anæsthetics*. The other imputations cast upon the honesty of the members of the Association might or might not be entitled to some consideration on the part of his readers if the editor had given publicity to the name of his informant.

Editors have rights, privileges, duties, and very grave responsibilities, and if they are members of the national and other associations they are bound to maintain the code of ethics. The members of these associations have also rights, which they should assert in season and out of season, and one of those rights, unfortunately for the professional tone of dentistry, has too often been unasserted. It is our duty to give support and praise when they are deserved, and also our duty and our right to criticise and condemn the editors of dental journals, and trade journals professing to be professional, whenever they allow to appear in the journals they edit any edi-

torial, any communication, correspondence, or questionable advertisements that will tend to lower the professional tone of dentistry.

They should be looked up to as the guardians of the honor of the profession, and they, of all men, should "avoid everything calculated to discredit or bring dishonor on the profession." If they fail in this respect, no special privileges should be granted to them, and they should not be permitted to take up the time of associations by reading their papers or to take part in any of the discussions. It is time that the code should be respected and enforced fearlessly, and that all dentists who claim the privileges of membership in professional associations, whether they are editors, professors, commissioners, or examiners, or men of wealth and prominence in the community, should be brought up with a quick turn if they are found transgressing the code. If this is not done, the term professional is a misnomer and associations are a failure. The code of ethics embraces and includes all that is professional and moral. The man who lives up to its requirements must and will be a gentleman and a Christian in the fullest and broadest acceptance of both those terms. To my mind, one of the causes of the low moral and professional tone so noticeable to-day is that all of us have shirked a duty. We have suspended the code like the sword of Damocles only over the heads of many hard-working men striving to earn enough to support a family, while editors, professors, and men supposed to have wealth have been allowed to transgress not only the spirit but the letter of the code without reprimand or censure. Dentistry to-day is suffering, as the country is suffering, from a combination of malignant influences: trade methods and the pushing to the front of low-priced materials, the "jingo," "get-there-at-any-price" element, "cheap-john" establishments, and the illustrated yellow-toned character that has been gradually creeping into journalism. All must have noticed what our lamented good old friend Dr. Atkinson used to call the "retrograde metamorphosis" that has been going on for some time, and, while it is to be regretted, we still may foster a hope that the influence of The New York Institute of Stomatology and kindred associations throughout the country, working along the same line, may before the century runs its course clear the professional atmosphere.

Dr. Potter.—I want to say only one word, and that is in regard to anæsthesia. It seems remote from this subject, but I am one of those who believe that Dr. Morton had an important part in the introduction of anæsthesia, and I think that one reason why he failed to get the credit that was due him for his share in the work

was because he undertook to patent his process. We know very well that it was not long before there were rival claimants, and they seemed to come up when financial considerations were brought strongly before their minds. I believe if Dr. Morton had given out freely the result of his work he would have received the full credit for it.

Dr. C. T. Stockwell.—There are two points of Dr. Howe's paper which seem to me absolutely fundamental and all inclusive, regarding the whole matter under discussion. These points are embraced in the following quotations from the synopsis of his paper, which was kindly submitted to me in advance:

1. "The ethical tone of dentists needs elevating."
2. "Professional character depends on moral relations of practitioners to one another and to the public, not on kind of work done."

In regard to the first quotation, it may be said that this is a statement of universal application. It is a need that is felt in all professions, in all strata of life, throughout society as a whole; and it is a fact that should afford us encouragement rather than the reverse. It means that the *ethical sense* in humanity is surely growing. It means that the ethical standards of the past do not satisfy us to-day. It means that the world is moving towards higher ideals of human relationships. So I say that the very fact that we are so conscious that the ethical tone of dentists needs, and so sorely needs, elevating is one of the encouraging signs of the times. It surely means an upward-tending professional life.

It is doubtless true that the question of ethics, so far as the average mind goes, both in and out of the professions, is a question surrounded with much of vagueness in its apprehension. It does not lie in the common mind with any clearness of definition. Because of this fact Dr. Howe has done us a service of marked value, it seems to me, in formulating a perception of the real professional character in a manner so clear-sighted and comprehensive,—viz., "Professional character depends on moral relations of practitioners to one another and the public, not on kind of work done."

Let us examine this statement with some care. Allow me also to express the hope that it may mark a new epoch in the progress of our profession.

For half a century past, more or less, the chief field of interest and work has been along scientific lines. The "stars" in our profession have been its scientific workers. Consequently we very naturally have come to regard such men as *types* of professional

character. We have failed to perceive that a deeper law underlies this question. Even now, I apprehend, it may be questioned by some whether the emphasis should be placed on moral relations or on scientific efficiency, on skill in operating, or on ethical observances with one another and the public. The fact is, however, that true moral relations imply and include efficiency in knowledge and quality of work done. The ideal dentist or professional man is one who is both scientific and ethical. He may, however, be thoroughly scientific and at the same time very unethical,—in other words, in no sense professional.

Let us try to express in as few words as possible the real meaning of these two terms, the scientific and the ethical. Or, rather, let us bear in mind the distinction implied when each term is used. With what realm of thought or fact does each, in an exact way, deal?

Science, as we all know, is correlated with what can be dealt with by the methods of observation and experimentation. Science deals with the *facts* of man and his environment. Ethics, on the other hand, deals with purely ideal conceptions, which can neither be seen nor handled, nor experimented with, and are true to the mind alone.

If our end and purpose in life be to secure the happiness and prolongation of human existence, we shall find on examination that these ends of ours have their genesis not in science, but in ethics. Science may and does inform us as to what means we must use to secure our ends; but as to what our ends *should be*, as to the supreme rules of action, we must go deeper than science. Conscience is ever thundering in our ears, "Do right." But it never tells us what is right or what is bad. These are relative terms. The *ought to be* in all the relations of life has never been tested, has never been verified by actual experience, and so lies beyond the plane of the scientific method. Perfection in any realm of life has never been actualized in human experience, and so has not been verified in fact, and is not verifiable in the strict scientific sense. Nevertheless we *believe* in high moral ideas, not because we have seen them fully and completely embodied in any given individual, but because of their own intrinsic attractiveness and authority. There is *something* in man that responds to these ideals—call it what you will—and evolves the ethical sense. Hence arises ethical progress.

As the ethical sense develops and becomes refined, the ethical standards of yesterday are found wanting when measured by the

ethical requirements of to-day. Thus the facts, the actualities of existence ever lag behind the ethical ideals that shape themselves in man's apprehension.

And so it appears that beyond the realm of *what is*, the scientific, ethics opens the realms of *what ought to be*. Science deals with men as they *are*, while ethics deals with men as they *ought to be*.

Viewed in this light we at once perceive that a vast distance stretches away between one point and the other,—between the general fact of experience on one side, and the moral imperative on the other.

We also see that a high ethical ideal is the nerve of progress. History shows not only that every great and masterful mind has its genesis in some deep conviction, but also that such minds express that greatness by striking out for the thing in which they so strongly believe. Such a man is dominated by his ideal in all his actions. It gives point and purpose to life. It nerves those who, to quote a reformer's words, "rise from the lap of artificial life, fling away its softness, and startle you with the sight of a *man*."

The supreme question then for each is, What is the ideal of life, and how shall it be pursued? Here we come to the foundation of all ethics, and as are a man's ethics, so is his life, for no life can rise above its ethical convictions.

The oft-repeated question as to whether life is worth living must find its answer in the related question, What is life for? If money, power, social position, our own pleasure and happiness merely, are what we believe in and live for, life may very likely not prove to be worth living. But if our conviction is that life has a high ideal, and that our highest aim is to realize it, then life takes on an incalculable dignity and worth.

Those of us who are familiar with the literature of the scientific world to-day cannot have failed to notice that it is conceded on all sides that the ethical life, in its completeness and perfection, is the logical, the inevitable goal of that process of the world's on-going termed evolution. It is towards this end that all the forces of the universe are seen to be steadily and surely tending. This is the *ideal* that is the inherent and most real of any grade of "realism."

A recognition of this fact explains why it is that the study of ethics occupies the attention of the world's best minds to-day as never before. Ethical societies, ethical literature, ethical professorships abound increasingly. Old systems are being discarded and recast continually. The very best brain and heart of the world are engaged as never before in an effort to readjust and elevate the

ethical standards, and to apply them to all the various phases of our complex life. The study of political economy and of economics is to-day considered an essential in even business and commercial life. These studies involve the deeper problems and principles of ethics. Men are *forced*, willing or otherwise, by the exigencies of business life to consider the questions of ethics. And the fact is being increasingly borne in upon the minds of all thinking men that there is no health to the individual apart from the health and well-being of all. The human family are to-day brought so near together, and interests are so interwoven in all directions, that if one suffers all must suffer. Not only social and economic interests, but moral interest and well-being are dependent upon standards that are common and in a large sense universal. Herbert Spencer formulates this conception in the following pregnant statement: "No one can be perfectly free till all are free. No one can be perfectly moral till all are moral. No one can be perfectly happy till all are happy."

But what application, you may say, has this line of thought to our profession, its duties, and privileges?

I answer as follows: The principles and laws that I have thus briefly considered are fundamental laws and principles, and underlie our profession in the same way that they underlie life in any and all forms. Any standard or code of ethics must rest, therefore, upon that enlightened conception of what *ought* to constitute the relations of man with man,—not that which is merely "practical," but that which is ideal.

There is, in fact, but one ideal for all of us, either as members of a profession or as members of society in general, *his highest self*,—highest in moral purpose and aim, and highest in the power to do, to execute, to *actualize* these moral ends.

This is the law written in each and every soul. It is absolute and universal. We do not and cannot choose it. It chooses us, and makes its logical pursuit the highest possible attainment. To set up any idol, of whatever nature, in place of this ideal, is to violate the highest law of our being. It is founded in the nature of things; and nature ever stands ready to vindicate her own laws.

This is nature's method. What has been our course? In all our attempts at legislation we have, thus far, entirely lost sight of the true basis of the professional character. We have attempted to base it on science or scientific efficiency. Such candidates for practice as have successfully passed our scientific examining boards we have vouched for as safe, reliable, true, professional men. They

stand before the public equally sanctioned and endorsed by the high authority of the State. There is no practical discrimination whatever on the only real grounds of professional standards,—viz., moral relationships and ethical aims. It may have been, and probably was, legal for one of our State examining boards to license a convict who was, at the time the license was issued, serving his sentence in the State's prison. But what a burlesque of ethical standards!

From the stand-point of professional character, our State legislation is thus far worse than utter failure. Much, it is freely admitted, has been gained on the purely scientific side. But this gain, desirable as it is in itself, is more than offset in the practical outcome of these laws by a grossly lowered state of the professional status. Seven-tenths, shall I say, of those who pass our State boards are, in practice, actuated simply and solely by motives no higher than that of personal commercial gain. The State, while vouching for their scientific efficiency, does not provide, by any effectual means whatever, for their professional conduct. It does not guarantee the public against non-professional treatment at the hands of these men. They may possess the requisite knowledge to serve the public properly. But when we scan the newspapers, the street signs, etc., we know that the only object is money, and money alone, utterly regardless of the best welfare of those who, unfortunately, fall into their hands.

True, sadly true, it is to-day that the one great need of our profession (if indeed we may call it a profession) is the elevation of its ethical tone. Let us, if need be, rest upon our oars for awhile, along scientific lines, and concentrate all our energies upon those moral and ethical aspects which alone give us any claim to a place among the honorable professions.

Dr. Meriam.—We seem to overlook one point. That is, what we secure by *not* patenting: the advantage of association, the unconstrained professional life and intercourse. Our friends here in active medical practice will bear me out in saying that if operations were patented consultation would be impossible. It is a great pleasure that this question has broadened since we took it up some years since. Liberal professions are not liberal by vote, but because freedom is essential to their members in ministering to the needs of mankind. Even our patent advocates would not call or employ a physician who was not free to treat them, or one who was obliged to obtain the consent of another physician before he could prescribe a remedy or use an instrument, but would insist upon a man free to use anything for their good.

Then the freedom in imparting information is important, in open meetings and papers, and the social professional intercourse. Contrast this with the barred doors, curtained windows, and stuffed key-holes of the patent worker. "No Admittance" is the sign displayed at the door of the inventor's workshop. It is not seen on the doors nor does it show itself in the lives of men who make up such a society as this. I am glad that Dr. Howe has brought out the subject of copyright, for though it seemed sufficient years since to point out that copyright had never been used in medicine to limit its freedom, yet it was a point behind which many took shelter who did not see that the answer was all around them in schools and libraries.

Some years ago I was asked to report what I had done in investigating the subject of gutta-percha. I went to the Public Library in Boston, stated my object, and was taken into one of the alcoves, given a table, and a boy brought me the journals and books containing matter relating to the subject. This is going on in all the libraries in the country. In fact, a few earn a livelihood looking up subjects, and the points thus gathered enter into new books, papers, and addresses.

Contrast this with the continual "law suits," "interference," "infringements," etc., over machines that are patented at every joint or part and the secrecy in which the inventor works. I doubt if the inventor spends more on his models than you, gentlemen, spend in getting up papers, specimens, and all that makes a professional life possible.

There is the rule that the conduct of members should be such that if universally imitated would result in the highest good of all; contrast this with the practice of a body which should sell to parties not of it each discovery that it might make. What would be the result if a boy sold part of his inheritance when he required anything to supply his needs? He would soon toil as a workman in fields that his father loved or sleep as a hireling 'neath the roof to which he had been heir.

Dr. Shumway.—I do not think I ought to take up the time at this late hour; certainly it was wholly unexpected, and it is rather a strange place to put me, for I am a patentee. About seventeen years ago I took out a patent, but if one takes out a patent that is not good for anything he does the profession little harm, and as about nine-tenths of the patents never amount to anything we are not in such great danger as we imagine. This is a very fruitful theme for discussion, and I must say that I sympathize with what

Dr. Rich has said. We may be in danger of shutting ourselves up and preventing progress, but it will not do to stop where we are. While we have a great many inventions, and some valuable ones, if we should stop now I am inclined to think that dentistry would be rather a failure. I was in Providence a week or ten days ago, in the office of one of the dental examiners of the State of Rhode Island, a very fine man indeed, and he deplored the condition of dentistry, saying that "Rhode Island was overrun with 'Cheap Johns.'" "What," he said, "is to be done? The more law we have the worse off we seem to be; we do not know what the outcome is to be. We ought to have some sort of law obliging a man to put his name over his door instead of 'New York Dental Parlor' or 'Boston Dental Parlor,' etc., where no responsibility is fixed at all upon the individual." He further said that "it is lowering the standard of dentistry and doing us an immense deal of harm." If we stop now we are in danger of going down-hill instead of going up to the high plane where we desire to be. As I said, it has been a source of financial loss to me to be a patentee. It was a most unfortunate thing for me that I conceived the idea of doing things a little differently from everybody else. If one stands alone his patients may look upon him with distrust. I have had them say to me, "You do not do this as Dr. — does. Why, he filled my teeth with a heavy lead mallet. I do not think it possible that you can do good work with such a slender instrument as that of ivory. Will you please put in something temporary as a stopping." Alas, for my patent! If a man takes out a patent it does not follow that he will become rich out of the profession. There is no money in a patent unless it happens to be a good one, and very few of us ever get a good one. Now, I do not wish to be understood as saying that a thing may not be good in itself. I am speaking of patents from the money stand-point. What I have patented I believe to be of very great value. In fact, it changes cohesive gold from being "the most dangerous material for filling teeth" to the best material for tooth-preservation. Nothing can be more valuable in my judgment from the professional view. A patent may bring large returns, but it must be of a kind to meet present needs, without too radical a change in methods. This is what I mean by saying it was unfortunate for me to be an inventor and patentee. I would express exactly what Dr. Rich says, that I do not think any professional man has a right to patent a nostrum or any process of curing disease or putting upon the market any secret remedy.

The President requested the Secretary to read the following letter from President Eliot, of Harvard University:

"HARVARD UNIVERSITY, CAMBRIDGE, MASS., March 31, 1898.

"MY DEAR SIR,—I have always held that the dental profession should be assimilated to the medical. Now, it is a main characteristic of the medical profession that it gives away without price every discovery which it makes, and that it admits no such thing as a secret remedy or practice. It is therefore my opinion that a reputable dentist should never take a patent on any instrument or material used in dental practice; and, moreover, that a reputable dentist should not trade in dental supplies.

"My opinions on this subject are doubtless influenced by my long converse with University practices and ideals. The University discovers and invents, but invariably gives away every discovery and invention. In every medical and dental school the teachers are constantly training up young men to supplant themselves. They are bringing forward their own successors, and, as they hope, making them their own superiors in knowledge and skill. This is the truly liberal practice; and if the dental profession expects to win the title of a liberal profession, its reputable members must conform to these professional standards.

"Very truly yours,

"CHARLES W. ELIOT.

"E. A. BOGUE, M.D."

The following is an extract from a letter received from Dr. W. W. H. Thackston, of Farmville, Virginia:

"I am with you and The New York Institute of Stomatology, heart and soul, in all your plans and efforts to redeem all American dentistry from disgrace and shame of 'patent rights,' 'secret methods,' and 'quack nostrums.'

"For more than half a century I have been fighting for a position alongside and on the plane occupied by the 'learned and liberal professions' and against all men and measures that dishonor dentistry as a legitimate department of science, and wherever I find men working for that end and object I am with them."

The President.—It seems, gentlemen, that the subjects for consideration this evening have been, as Dr. Howe expressed it not very long ago, floating in the air. At the end of the constitution of the National Dental Association, organized last August, occurs a resolution reading as follows: "*Resolved*, That the National Dental Association condemn the use of secret preparations known as 'local anæsthetics,' as well as other secret preparations."

In the January *Forum* is an article, I think by a lawyer, deprecating the taking out of patents, and the grounds of his argument are very much those of Dr. Shumway. He was answered by Elisha Foote, who was formerly commissioner of patents, but the answer is not as forcible as the original article, and it narrows itself down to very much the same lines of expediency. One of our

eminent surgeons said to me the other day, "It is a good thing to talk about ethics; a good thing to advocate high ethics. You have my hearty sympathy, and you shall have my hearty support; but you might just as well expect to convert the world to Christianity in short order as to expect to convert it to an altruistic doctrine like that. Go ahead; every step you take is to your advantage and the advantage of your patients."

The Institute directors the other evening appointed a committee to draft a resolution. That committee has done its work, and I would ask Dr. Davenport to present the resolution that it may be considered.

Dr. Davenport read the resolution referred to, which is as follows:

WHEREAS, It is evident to us that the conditions required for professional progress are now the same as they were when our honored predecessors established a periodical, journal, a society, and a college as means of interchanging ideas, disseminating knowledge, abrogating secrecy, and raising the required standard of education; and, whereas, our periodical literature cannot subserve its highest function if owned by manufacturing and supply houses, notwithstanding their enterprise, because their interests are not always identical with all lines of professional advancement; and, whereas, the common practices of withholding knowledge concerning the formulæ of compounds, and of patenting inventions and discoveries, operate to prevent the general diffusion of information and to deny freedom to put new ideas into tangible form; therefore, it is hereby resolved that we deprecate the use of secret compounds, and would urge dentists everywhere to dispense with their use as quickly as they can find other compounds of known composition to take their place.

And it is also resolved that dentists who manufacture or have an interest in secret compounds, or who patent their inventions or discoveries relating to the treatment of diseased or abnormal conditions of the human body, are retarding the progress of our profession, and it is also resolved that we would respectfully urge upon all College Faculties and the Association of Dental Examiners of the various States and the National Dental Association the need of considering present professional conditions and of adopting such measures as will bring about a change in the views and practices of dentists and students in regard to journalism and to secrets and patents.

We would hereby entreat all dentists to support by all means in their power the journals we have, not owned by supply houses, to the end that they may be made stronger and have the means to do their work of spreading knowledge and building up professional moral character more effectually; and it is hereby resolved that copies of these resolutions, signed by the President and Secretary, be sent to the faculty of each Dental College and to the Association of Dental Faculties and to the Board of Examiners of each State and to the National Dental Association.

The resolution was unanimously adopted.

Dr. Smith.—It seems only fair, in taking any position, that the person should have an opportunity to defend such position against those who assail him. If it is your pleasure to close the discussion of the subject, however, I would not wish to interfere with that.

The President.—Dr. Smith is correct, and I beg to apologize. He and Dr. Howe should have an opportunity to make reply to those who have spoken against them, and I have to request Dr. Smith to do so.

Dr. B. Holly Smith.—I wish to say that at no time have I taken a position which I do not intend to defend, and here my good brother from Washington brings the serious charge that a man of respectable character has placed himself in an absurd situation by advocating the absence of business methods and the doing away with the commercial spirit in professional matters. I feel that I would like to "get back at him."

My impression is that we have been entirely too tolerant in these matters. I will not answer his argument as to the disadvantage which he claims the absence of patented appliances would be to the progress of dentistry, because I do not believe, and I do not think there are three persons in this room who believe as he does, that the absence of patents on such appliances would stop the study and invention of these appliances. But I do want to say that, for myself, I would rather practise dentistry according to what I believe are the holy traditions of my profession, and do my duty according to these traditions, than to use all the patented appliances which have been devised for the use of dentists. I speak for myself in that, but I would much prefer to live up to these sacred traditions, which I believe is my full and absolute privilege, than to place myself under obligations to these commercial schemes and plans. I am reminded of a little incident. Smith said to Brown, "Have you any rats and mice in your house?" "Yes," answered Brown. "Well, what do you do for them?" Probably remembering the check he had to send to the Society of Antiquated Cats, to which his wife belonged, he said, "Do for them! I give them a place to live, and all they want to eat and drink. What do you expect me to do for them?" Now, that is what we do for these patentees. We give them a place at our meetings, receive them on an equality, and what else are we expected to do for them? I am glad to appear before the society to defend purer and holier methods. I recall the Song of Solomon:

"Awake, oh north wind; and come thou south;
Blow upon my garden, that the spices thereof may flow out,"

and I think that in this little conference we have had here we may invoke all influences towards holier and better thoughts, and send them forth to the uttermost parts of the professional atmosphere to spread purer and higher ideas.

Dr. Howe.—I do not think it is desirable for me to take up much time. I would just remark that the argument in favor of patents completely ignored the points made in opposition. It is not a question of whether or not we are willing to go without new appliances, but whether they should be obtained, with or without detrimental and damaging influences. Some improvements made on patented devices are not proofs that other improvements are not forbidden. It is sometimes advantageous to a patentee to make or permit improvements, but the power to prohibit and to shelve is inherent in patents, and is constantly used.

Adjourned.

S. E. DAVENPORT, D.D.S., M.D.S.,
Editor The New York Institute of Stomatology.

Editorial.

THE DIVORCEMENT OF DENTAL LITERATURE FROM TRADE.

OUR pages this month are largely devoted to a consideration of this subject. There should be no controversy with the views entertained by writers and speakers in advocacy of a more thoroughly professional spirit. The time is ripe for a readjustment of professional ideas and the relations of dentistry with trade, and there can be no two opinions in regard to the value of the papers and discussions presented.

It will probably be said, by way of criticism, Why repeat the old story? The time has not come when dentistry can be divorced from trade. This is the question conservatism always propounds when an effort is made to effect an alteration in the existing order. The active thinker who desires change, not for the mere pleasure of innovation, but from an earnest desire to improve on past methods, will not rest quiet because apparently insuperable difficulties lie in the path.

The history of dentistry is replete with the work of individuals. The very best examples of professional spirit are to be found here, and it is safe to assert that it will be difficult to find elsewhere more instances of devotedness and self-sacrifice in the development of a profession than has been manifested in dentistry. That this has not been universal is to be lamented, but the conditions were not present in the past to warrant an extended devotion to professional ethics.

The time was, and not far distant in the past, when it required all the patience and mental strength of the men in dentistry to deal with the problems daily presenting in practice. Very few, it is presumed, as they follow the prescribed rules for the preparation of an artificial denture, think of the great labor and constant experimentation required to reach the results accepted to-day. Only those who have followed the changes step by step can appreciate this, and it is equally applicable to every operation in prosthetic dentistry as well as other branches. While dentistry began more than a thousand years in the past history of the world, it had no development worthy the name prior to the middle of the present century.

This burden of growth was carried by every worker of intelligence, and in the effort to improve practical methods the cultivation of the professional spirit was lost to view, and a species of paternalism was established in the minds of dentists, producing a weakness in them as individuals and destructive to the vigor of the entire professional body.

The weak point in dentistry was that in a too extended cultivation of the practical the intellectual became submerged. The industrious student of the past literature of dentistry will find little to compensate him for his labor, it being in fact almost a barren field, with here and there a cultivated spot intensifying the surrounding desolation.

The world during its dark period is indebted to the monasteries of Europe for the partial preservation of its literature, and dentistry should give credit to the trade periodicals for the preservation of the most active portion of its history during the last half of the present century. What a treasure it would have been could we have had placed upon our library shelves the history, month by month, of the early period of the same century and of the last. We have only the record of individual experience in the few books issued.

It must not be forgotten, therefore, that we owe a debt of grati-

tude to the trade interest in thus preserving the most valuable facts at a time when the active workers were unable or unwilling to make any move for the intellectual advancement of dentistry. The fact of this indifference is plainly manifested in the failure of the first professional journal. Its life was short, and its pages do not give marked evidence of intellectual force broadcast in the dental field. It was evident that it was left to the few to labor untiringly and without reward save that which belongs to a duty unselfishly performed.

The so-called trade journals have therefore given a service that must be gratefully recognized and remembered, and they are still performing it with varying degrees of success. It is understood that this service was not unmingled with the selfishness of trade, but that it has helped, in no minor degree, to build the foundations upon which the superstructure will rest for the future, remains a fact in dental history.

The question that now concerns the dental profession is, Has it reached a point in its development when the crutches, on which it has leaned for support in the past, may be cast aside? The answer to this is given in the articles published. It is needless to say that this journal is the exponent of the sentiments there detailed, sentiments which recognize that dentistry has arrived at a stage when old methods must be gradually discarded and a periodical literature established exclusively its own. That this cannot be an easy task is recognized both theoretically and experimentally, but the true life of the profession can never be exemplified in any other way and the progress of the age and of our work demands the change. This means no disparagement of the ability with which some of the journals are conducted and issued by supply houses. It is acknowledged that they are ably edited by men active as leaders in the intellectual advancement of dentistry. The fact that they are thus lending their aid in this direction serves to enforce the importance of a change in the prevailing sentiment of the profession. Instead of dividing their interests their intellectual powers might be better devoted to the upbuilding of the forces that make for progress in their calling. The important aid given by trade to dentistry has been fully set forth, not only in this article, but in the leading thoughts of previous issues, credit having been ungrudgingly given whenever or wherever due, but while this remains as written there is still a very large proportion of selfishness that would seem to cling to all connected therewith.

The argument set forth by one of the editors at the meeting

alluded to, which seems to the writer to be unworthy the origin, in that they appear to glorify the ability of the trade journals to crush all attempts on the part of the profession to introduce an independent literature. It is the old story of the power of money. The quotation from the remarks of the editor indicates a spirit not commendable or worthy of imitation. He says, "Do the members of the Institute think they can start a wave over the country which will support a dental magazine and reach the standard which has been set by some of the so-called trade journals, when it is a certain fact that it will be reached only by a loss of from ten to eighteen thousand dollars per annum?"

It is understood that the publication of a journal is an expensive business, and that the trade houses are willing to spend large sums from which they can expect no direct returns for the privilege of bringing their wares to the attention of the profession. In doing this they simply cater, not to professional, but to selfish interests, and the glorification of the fact, if such it be, that they are able, through the aid of capital, to do more than can be done by an unselfish work for the good of others, does not sound well coming from the source from which it emanated.

It is acknowledged that the dental profession has had to contend with the power of money. This has debauched it in the past, and will continue this work, until men can be found willing to make sacrifices equal to that made by this power and in the same direction.

While the "paltry salaries" dwelt upon may not be the inducement which has led men to lend their energies to the development of trade, it nevertheless remains a fact that, were these services not given, trade journalism would wither in spite of capital.

More than this, individuals and societies are engaged, with a few honorable exceptions, in feeding the pages of the trade journal under the specious plea that capital can illustrate gratuitously and that their articles will be given a larger circulation. The first claim is not correct, for a professional journal can and does illustrate, and the second is equally erroneous, for no article worthy to live is ever buried in any publication. This is proved by the extensive repetition, in both domestic and foreign journals, of all original matter. This criticism is made generally by writers whose articles are produced, not through original researches, but from ideas gathered hither and thither, frequently without due credit. These, of course, have not an extended circulation, and probably have but few readers no matter where published.

It is unprofessional, in the opinion of the writer, for a society to barter its work to the highest bidder. It is here that capital always has the advantage, not to its discredit, but to the society that takes advantage of the offers made. The example has been set by the leading association of the country, and has been followed by subordinate societies until we have lost, in large degree, professional instincts, and have descended to the region where the sale of our best thoughts has become a settled practice.

That all this is wrong and unprofessional needs no argument. It is even admitted by those engaged in the practice, with the accompanying excuse: "That the money is needed for other purposes, and it is therefore right and a good business operation to sell proceedings to the best bidder procurable."

The hour is upon us in which the dental profession must stand for higher things. While it is not supposed there will be any marked or sudden change for the better, there should be an immediate and sharp dividing line drawn between that which has sustained the profession in the past and that which will add to its honor and effectiveness in the future. Dentistry needs, and must have, a periodical literature all its own, and the time has come when this must be fully recognized. The intelligence combined in its ranks must work for it until capital is forced to seek other means to satisfy the demand for a knowledge of its wares or disclaim the present attitude of two-thirds trade and one-third professional, for one wholly of trade with no abortive attempt to guide dental thought into channels not recognized as strictly ethical. In this way both branches of the great work of building up dentistry will be developed with self-respecting labor upon both sides and with less of the crimination and recrimination now so unpleasantly apparent, resulting in injury to both wings of an honorable calling.

THE NATIONAL DENTAL ASSOCIATION.

THIS body adjourned at Old Point Comfort to meet at Omaha; but it is learned from the chairman of the Executive Committee that it is thought this selection was not a wise one, and efforts are, at this writing, about to be made to secure the consent of the members to a change. When it is considered that eighty-six organizations are advertised to meet at Omaha during the continuance of the exhibition, it does seem as though some action was necessary.

The question, Where shall the National go? will assume first importance to the members in the next few weeks. Probably before this reaches our readers it will have been decided. The choice is limited, and, it is presumed, will lie between Chicago and Denver. While the former is convenient, and possesses many advantages, it certainly will not meet the views of many, and especially those resident on or near the Pacific coast. One of the objects in locating the meeting this year West was to accommodate these, and it is due to them that it should be held as far west as possible. Denver meets this want, and it is certainly to be desired that this place be selected for the meeting of the national organization as well as all other contributing bodies.

THE FUNERAL OF DR. THOMAS W. EVANS.

THE final ceremonies over the body of Dr. Evans took place on Wednesday, May 25, at the Protestant Episcopal Church of St. Mary, Thirty-ninth and Locust Streets, Philadelphia. The services were confined to the usual ritual of that religious denomination.

The body was placed in a lead coffin, covered with aluminum, giving the unique appearance of being encased in silver. This prevented the use of handles, and the great weight required the services of eight men to carry it upon their shoulders.

The most impressive lesson conveyed by these obsequies was the evidence given that the honors conferred upon the majority of men, unless based upon an enduring foundation, die at the entrance to the tomb. Dr. Evans was the professional adviser of emperors, kings, and nobles, and a friend of many. Yet, outside of the immediate relatives and officials, he had scarcely sixty persons to honor his remains, and the members of the dental profession, of his native city, were conspicuous by their absence. It was, to the writer, a sad reflection of the instability of all earthly honors, even though accompanied by great wealth.

Dr. Evans's real work in the dental profession has received due credit elsewhere, but it is worthy of repetition here that the labor of his life in certain directions did much to place dentistry upon a higher level of appreciation; more, perhaps, than was accomplished by any other man of his day and generation.

The body was temporarily entombed at Woodland Cemetery, in a vault specially prepared, in which his wife had previously been

laid. Here they will remain until the mausoleum is built, provided for in his will. When this may be it is difficult to say, for while the will has been probated, the contending heirs seem determined to carry it through the courts, and it may be months or years before litigation is ended. When it is finally sustained, as doubtless it will be, there will be other difficulties to be met in the establishment of his college and museum, the fulfilment of his aspirations and an evidence of his devotion to his profession.

Bibliography.

A SYSTEM OF DENTAL SURGERY. By the late Sir John Tomes, F.R.S. Fourth Edition, revised and enlarged by Charles S. Tomes, M.A., F.R.S. With two hundred and eighty-nine illustrations. Philadelphia: P. Blakiston, Son & Co.

Tomes's "Dental Surgery," long recognized as a standard work, comes to us much improved by revision and intelligent editing. Considerable obsolete matter has been stricken out, its place being well filled with principles and methods of more recent origin. It is one of the works that should be found in the library of every dentist or physician who attempts to keep abreast with the advance in dental surgery.

Several of the chapters, however, could yet be reduced to advantage, and the work would be much improved were it well illustrated. The editor, too, does not always make his subject sufficiently clear for students' use. For instance, under erosion of the teeth he cites several cases, showing that dental erosion is a fact, but does not offer a satisfactory hypothesis as to the cause of this lesion. Later investigations, however, indicate that etiology of dental erosion is the result of the action of acid secretions from the labial glands, caused, probably, by the patient being of the uric acid diathesis. In some cases, where these glands become diseased or enlarged, Professor Brubaker is on record as recommending their destruction by the electric needle. But none of this is referred to by Mr. Tomes. Under methods of filling carious teeth, retaining points or pits are recommended for anchorage instead of the groove or undercut.

These imperfections, we trust, may be rectified in future editions; but, all in all, the work is a distinct fulfilment of the author and editor's useful aims.

G. W. W.

ELEMENTS OF LATIN. For Students of Medicine and Pharmacy. By George D. Crothers, A.M., M.D., Teacher of Latin and Greek in the St. Joseph (Mo.) High School; formerly Professor of Latin and Greek in the University of Omaha; and Hiram H. Bice, A.M., Instructor in Latin and Greek in the Boys' High School of New York City. $5\frac{1}{2} \times 7\frac{1}{2}$ inches. Pages xii-242. The F. A. Davis Co., Publishers, 1914-16 Cherry Street, Philadelphia; 117 W. Forty-second Street, New York City; 9 Lakeside Building, 218-220 S. Clark Street, Chicago, Ill.

While this book is not intended as a means for the requirement of Latin in its general sense, it certainly does give a clear conception of the use of this language as applied to medicine. The nomenclature of medicine is a wordy labyrinth that the student, even with some knowledge of Latin and Greek, finds himself in a maze of difficulties. It is in fact a new language to him, which must be learned with all the usual labor given to the acquirement of words. This is more readily accomplished in proportion to the amount possessed of the original tongues from which most of the words used in medicine or dentistry are derived or formed. It is, therefore, a great saving of time to have a work of authority as complete as this to refer to as occasion demands.

Some students enter upon the study of medicine who have taken their preliminary training in schools where Latin is not made an obligatory study. These, fortunately, are comparatively few, but for these this book is especially recommended. In fact, it is difficult to understand how the study of medical and dental terms can be accomplished by these without the aid of this or a similar book. To familiarize one's self with the roots of words is more than half the battle in the struggle with definitions.

Notes and Comments.¹

DO THE NERVES GROW OLD?—Commenting on the common causes of nervous disorders, Professor W. H. Thomson says, "The message of modern science about the nervous system is more hopeful than ever. It tells us that the nervous system has a greater store of reserve vitality than all the other bodily systems put together. It is the only texture that is found not to have lost weight after death by starvation, as well as after death by any cause. It is the last to grow old; and, as to the mind, it need not grow old at all, provided it be steadily applied with that mighty spiritual element in us which we call interest. Even the muscular system can be wonderfully sustained by interest; for should a man attempt the same muscular work on a treadmill which he lightly endures along the mountain brook after a trout he would faint dead away. But the mind will by interest grow steadily, even while bone and sinew are wasting through age."

GOLD IN AMALGAM.—Dr. W. W. Coon, in a paper read before the Eighth District Dental Society, Buffalo, N. Y., says, "I have never found an amalgam alloy that was not improved in the using by the addition of gold. I have spoken of the matter occasionally to dentists, and in a few instances to manufacturers, and the usual reply has been founded on what has appeared in print,—viz., 'uncertain usefulness.'"

The doctor says that the uncertainty has long since vanished from his mind, as he quite often sees in the mouth of some old patient an amalgam filling that attracts attention because it is better than the others he has inserted in the same mouth, and, in looking it up in his records, finds that gold is the differentiating factor.

REMOVAL OF TEETH FROM RUBBER PLATES.—It sometimes falls to one's lot to remove teeth from an old rubber base. It is com-

¹ The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 1338 Walnut Street, Philadelphia.

mon to proceed by holding the plate over a gas-jet until the teeth can be pried off, and in doing so operators seem to forget that the odors of H_2S , S_2O , and other gases have found their way to the remotest corner of the room, and possibly to adjoining premises. This might be avoided by boiling the plate for a few moments, when the rubber will be found yielding, and by grasping it with the pliers the rubber may be sprung from the teeth, and a few repetitions will complete matters.—*Ohio Dental Journal*.

Current News.

ALUMNI SOCIETY OF THE PHILADELPHIA DENTAL COLLEGE.

THE Annual Meeting of the Alumni Society of the Philadelphia Dental College was held at three p.m., March 31, in the college building at Eighteenth and Buttonwood Streets. President Leo Greenbaum, M.D., D.D.S., occupied the chair. Many of the alumni were present.

The Committee on Photographs reported the receipt of the photograph of the late Dr. Thomas Evans, of Paris, and appealed to the alumni in general for gifts of enlarged photographs or oil portraits of men eminent in the profession.

The Committee on Certificates of Membership reported progress.

The following papers were read and discussed. By W. G. Chase, of Philadelphia, "Caries of the Maxilla." By Dr. W. A. Capon, of Philadelphia, "Practical Points on Porcelain Inlays." By Dr. J. A. Boland, of Philadelphia, "Experiences in Dental Practice."

The election of officers resulted as follows:

President, Professor Leo Greenbaum; Vice-Presidents, Dr. Charles E. Butler and Dr. J. W. Allen (Class of '98); Treasurer, Dr. Charles Vanderslice; Secretary, Dr. Otto E. Inglis; Corresponding Secretary, Dr. Eliza Yerkes.

Adjourned.

OTTO E. INGLIS,
Secretary.

CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

At the Annual Meeting of the Central Dental Association of Northern New Jersey the following officers were elected for the ensuing year:

President, F. Edsall Riley, D.D.S., 474 Broad Street, Newark; Vice-President, C. S. Hardy, D.D.S., Summit; Secretary, H. S. Sutphen, D.D.S., 24 East Kinney Street, Newark; Treasurer, Charles A. Meeker, D.D.S., 29 Fulton Street, Newark.

Executive Committee.—F. G. Gregory, D.D.S., Chairman, 7 West Park Street, Newark; Fred. C. Barlow, D.D.S., Jersey City; C. W. Boblitzell, D.D.S., Jersey City; W. H. Pruden, D.D.S., Paterson; W. E. Truex, D.D.S., Freehold.

H. S. SUTPHEN,
Secretary.

CHICAGO DENTAL SOCIETY.

List of officers of the Chicago Dental Society for 1898-99, elected at the Annual Meeting, held Tuesday evening, April 5, 1898: President, J. E. Hinkins; First Vice-President, D. C. Bacon; Second Vice-President, E. A. Royce; Recording Secretary, Elgin Ma Whinney; Corresponding Secretary, C. S. Bigelow; Treasurer, E. D. Swain; Member Board of Directors, J. G. Reid.

Board of Censors.—A. W. Harlan, W. V.-B. Ames, C. N. Johnson.

C. S. BIGELOW,
Corresponding Secretary.

DENTAL SOCIETY OF THE STATE OF NEW YORK.

At the Thirtieth Annual Meeting of the Dental Society of the State of New York, held on the 12th inst., the following officers were elected for the ensuing year:

President, F. Le Grand Ames, D.D.S., Albany; Vice-President, John I. Hart, D.D.S., New York; Secretary, Charles S. Butler, D.D.S., Buffalo; Treasurer, Charles W. Stainton, D.D.S., Buffalo; Correspondent, R. Ottolengui, M.D.S., New York.

CHARLES S. BUTLER,
Secretary.

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Original Communications.¹

RESTORATION WITH PORCELAIN IN FRACTURE OF THE TEETH.²

BY L. FOSTER JACK, M.D., D.D.S., PHILADELPHIA.

I PRESENT a few notes and a diagram or two from which I hope to demonstrate the use of porcelains for the restoration of teeth that have been fractured. The method to be described is particularly directed in its application to those cases wherein the vitality of the tooth has not been disturbed,—that is, where the pulp has been but slightly or not at all encroached upon.

The use of porcelains is especially called for in fractures occurring in the superior incisors, but they may be useful as far back as the anterior surface of the first molar.

Pre-eminent stands the central incisor, most subject to fracture, either by a blow, a fall, or in ordinary use.

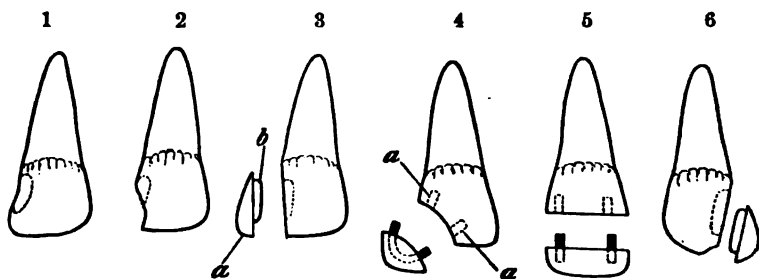
To be brief, we will turn to the diagram (Fig. 1). Here we have a left central weakened by decay on its mesial surface. The enamel, having been robbed of its support, is weakened and becomes frail. Its possessor bites upon something unusually hard, breaking away the corner, leaving an unsightly gap. (Fig. 2.) To

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before the Academy of Stomatology, March 22, 1898.

remedy this defect now becomes our task. It is simple but tedious, for the parts are small, and it requires exactness to be rewarded with a good result.

The first step in the operation is to cut the irregular walls formed by the fracture and cavity in a direct line from the cutting edge to the cervix (Fig. 3), grinding at the same time both the labial and lingual walls to the same plane, thus making a flat and even surface, with the exception of the cavity in the upper central portion. This is accomplished with a corundum or carborundum disk, one side of which is flat.



The next step is the preparation of the cavity. After the removal of all decay and softened tooth-structure the cavity is extended as far towards the cutting edge of the tooth as is compatible with strength, but is not made deep, care being exercised to avoid the pulp. The edges of the cavity are but slightly undercut. The floor should be nearly flat and convex if encroachment upon the pulp is feared. If the pulp is in danger, it should be protected from pressure, which may be exerted at a subsequent stage of the operation.

The tooth being now prepared, we proceed to the formation of the porcelain counterpart. The cavity in the tooth is lined with platinum foil; this is carefully removed, filled with porcelain body, and the latter fused in the Downie furnace. After stripping off the platinum the porcelain body is then placed in the cavity and ground flush with the walls.

An all-porcelain tooth-crown of appropriate color, and corresponding in form and size as nearly to the natural tooth as possible, is selected. From this we cut with a disk that portion which is desired for substitution. This is ground on the lathe until it is sufficiently diminished in size to correspond to the absent part of the tooth.

The grinding is done principally upon the straight side, and it is

not necessary to cut the labial surface if the tooth-crown has been well selected.

The relation of the outer porcelain (*a*) and inner, or retaining porcelain (*b*), is obtained by temporarily fastening the two together with wax and fitting them to the tooth. The wax is then replaced by a thinly mixed layer of the porcelain body and the two parts are fused together in the furnace. The piece is cemented to place, finely fitted, and polished.

Fig. 4 represents a case of fracture of the distal portion of a right central incisor, one which would probably only occur in a child from the result of a fall. In this case the preparation of the tooth is a simple operation. The line of fracture is made free from all irregularity and the curve trued. Two pits are drilled at the points *a, c* to the depth of one-eighth of an inch, in diameter large enough to freely admit No. 19 standard wire. It may be found necessary to enlarge them laterally at the opening to receive the retaining posts. The substitute is selected and cut from a tooth-crown as described in the foregoing case. It is then deeply grooved, with a diamond-shod disk, from the contact surface inward, forming an opening semicircular in form. Into this a piece of No. 19 stiff platinum wire is fitted, the ends being allowed to protrude one-eighth of an inch. The groove is then filled with porcelain body and fused. It is then ready to be cemented into place.

Fig. 5 indicates a straight fracture involving the incisal third of a central or, more frequently, a lateral incisor. The procedure in the preparation of the stump is the same as in the case preceding.

The porcelain tip is also formed as in the last operation, with the exception of the insertion of the retaining posts.

For the case under consideration a diamond-pointed drill becomes requisite, for the purpose of forming two pits for the reception of the retaining posts. These are of platinum and are retained by fusing as was the wire in the previous case.

Bicuspsids and molars, in which the mesial and a portion of the buccal surface has been lost (Fig. 6), can be restored in the way described for the proximate surfaces of the incisors.

It must be evident to all that the chief advantage of the method, if it has any, is in the fact that the porcelains can be ground to fit perfectly without the hinderance of pins or posts. Also that the porcelains are not baked for individual cases, but are selected from tooth-crowns in stock. Thus obviating the uncertainty in color. The method enabling one to select a shade and form as nearly perfect as possible.

Crowns best suited for the purpose are those of a fine texture, as they can be ground and polished to fit any irregularity and because there is less color-change than in the more porous bodies. By this I mean that there is often a surprising change manifested in the color of a porcelain after it has been set, due probably to the reflection and absorption of light. In this connection the selection of cement is an important consideration, for the porcelain can be varied a degree or two in shade, either lighter or darker.

EMPHYEMA OF THE ANTRUM.¹

BY DR. EMMA E. MUSSON.²

MR. PRESIDENT AND MEMBERS OF THE SOCIETY,—The anatomical relation of the roots of the teeth to the floor of the antrum will determine, to a great extent, the involvement of the sinus in various dental affections. Between the floor of the sinus and the roots of the teeth there may intervene a thick layer of bone, or this layer may be reduced to a mere line, or the roots of the teeth may protrude directly into the antrum.

In a case recently reported, of necrosis of the floor of the antrum following upon destruction of nerve-roots with arsenic, this dividing line must have been very slight. With the appearance of la grippe, the number of cases of inflammatory conditions of the accessory sinuses have been greatly on the increase, and a tendency has arisen to attribute maxillary sinusitis to nasal causes. Mr. Wolff, of Germany, in a series of post-mortem examinations, found in the majority of the cases of measles, scarlet fever, and diphtheria, some degree of inflammation of the accessory sinuses,—a point of great interest in connection with Moure's and Ziem's statements, that they have frequently found empyema of the antrum in children of seven years and over.

Very little work has been done, as yet, in the line of bacteriological examination of the character of the pus in diseases of the accessory sinuses, or of microscopical work as to pathological conditions of the mucous membrane of the antrum. Clearer knowledge on these points, as on that of the anatomical conformation of

¹ Read before the Odontological Society of Pennsylvania, February 12, 1898.

² Clinical Professor of Laryngology of the Woman's Medical College, Philadelphia.

the antrum and its relations to the ethmoidal and frontal sinuses, would materially lessen the present apparent divergence of opinion as to prognosis and the results of treatment.

Of twenty cases of abscess of the antrum collected from my books, eleven were chronic cases and nine acute; of the chronic conditions, in only two were the teeth removed as a possible cause of the empyema, and in one of these there was a clear history of infection following packing for nasal hemorrhage. In five no history could be gained; however, four of these cases dated back ten years and over. Three cases commenced with la grippe, and the eleventh case occurred in a patient suffering from pulmonary phthisis.

In the nine patients in which the affection was acute, one accompanied a severe cold in the head; one followed an acute infectious naso-pharyngitis; one, a nasal cauterization during the prevalence of la grippe; five were due to la grippe; and in the ninth case, in which the ethmoidal and frontal sinuses were also involved no possible cause could be assigned for it. The patient, a university student, had had, three weeks previously, a severe neuralgic pain in the left side of the face. The pain was attributed to a lower molar, and the nerve was destroyed, but without relief. After three weeks fever set in, and there was a free discharge of pus from the left nostril. At this time the patient came under my care and the above diagnosis was made. Though a month had elapsed before treatment was instituted, the inflammation of the accessory sinuses yielded rapidly to treatment, the main feature of which was the inhalation of oxygen through the left nostril.

In five of the chronic and in four of the acute cases of empyema of the antrum there was a coexisting inflammatory condition of the ethmoidal cells, or of the frontal sinus, or of both.

An acute abscess of the antrum may be usually diagnosed by its symptoms. The sudden onset of neuralgic pain in the face, which abates somewhat on the appearance of a profuse discharge of blood and pus from the nostril of the side affected, tenderness on pressure over the canine fossa, and fever are sufficient to warrant a diagnosis. As to pain as a symptom, Hajek thinks it is greatest with an antrum with a thin floor, as the dental nerves are thus in close relation to the mucous membrane of the sinus. A unilateral discharge of pus from the nose, flowing more freely when the head is depressed, is sometimes the only symptom that a patient with a chronic antral sinusitis complains of. If on anterior rhinoscopic examination pus is found oozing from beneath the middle turbinate

and on the same side the face remains dark on using the transillumination test of Voltolini, our diagnosis is sufficiently established to warrant surgical interference. I think the failure of the electric lamp to establish a diagnosis is due, except where there are anatomical abnormalities, to a lamp of too small candle-power or to a battery of insufficient voltage. I do not consider this test a final one unless the pupil of the unaffected side is thoroughly illuminated, although the majority of the text-books teach that translucency of the tissues in the infraorbital region excludes empyema of the antrum.

To illustrate this point: a patient with fair hair and skin and small-boned was suffering from a unilateral flow of pus from the left nostril. On examination with electric light there was no shadow in the infraorbital regions; the whole face was perfectly translucent, but the light was seen shining through the right pupil only; the left remained perfectly dark. After drilling through the left alveolus, the teeth being absent, a half ounce of foul-smelling pus was syringed out. A month later both pupils could be illuminated.

By means of the electric lamp a diagnosis can be made from a cyst of the antrum, as the side affected is more brilliantly illuminated where there exists cystic disease.

A cure of abscess of the maxillary sinus is not always followed by a complete disappearance of the shadow in the infraorbital region on transillumination, as a thickened mucous membrane may still remain. The first point at which the translucency of the tissues begins to reappear is at the inner angle of the orbit, gradually extending outward till the whole infraorbital region is clear.

Anatomical abnormalities will complicate the correctness of Voltolini's test. The orbital plate may be thick and dense; the antrum itself may be small or rudimentary, or its walls compressed laterally, or the external wall of the inferior meatus may encroach on its lumen. In the negro race the pigment interferes with the transmission of the light.

Lichtwitz, as a diagnostic measure, punctures the inferior meatus, using a very fine trocar and canula of his own design. Gavel diagnoses antral abscess by syringing it out through the ostium maxillare, having succeeded in passing the catheter in twenty-eight cases out of forty. The canula used is according to Heryng's pattern, with bent tip. It is introduced with curve downward in the direction of the middle meatus. Having passed the anterior portion of the middle turbinate, the curved extremity of the canula is passed outward and the hiatus semilunaris is gently

explored; the sound becomes suddenly engaged in a small cavity which does not permit of it being moved either backward or forward. Zuckerkandl states that the ostium maxillare is profoundly hid by the inferior lip of the hiatus semilunaris, and even if a probe is introduced into the opening it is exceedingly difficult to push it anteriorly into the cavity of the sinus, as the ostium forms a canal whose direction is from above downward and from behind forward, —exactly opposite to that of an instrument penetrating into the middle meatus. In the specimens I have examined and show here this evening, preliminary removal of the anterior portion of the middle turbinate would be necessary to make possible the syringing out of the antrum through the ostium.

In acute infections of the antrum, whatever the cause, much can be done to shorten the attack and lessen the danger of its becoming chronic. The primary necessity is to establish good drainage, first, by keeping the ostium maxillare patulous by such means as will allay inflammation of the mucous membranes of the nasal cavities and the antrum, and in the second place by employing various methods for emptying the antrum of pus, directing the patient to lie on the non-affected side with the head dependent over the edge of the bed, and several times during the day practise aspiration of the contents of the antrum according to the method of Dr. Moll, given at the last annual meeting of the Dutch Laryngological Society. It consists of the aspiration of the contents of the accessory cavities by a forcible inspiration, while the mouth and nose are firmly closed. In this way the chest is inflated and there is a considerable diminution of pressure in the accessory cavities, and the liquid contents are drawn out, as is proved by the reappearance of pus in the middle meatus after cleansing. In a case in which there was a perforation of the alveolus Dr. Moll proved a diminution of pressure of fifteen millimetres.

The use of oxygen in inflammatory conditions of the accessory sinuses was first suggested to my mind by Mr. Stokes's (of London) enthusiastic advocacy of it in chronic abscess of the middle ear. Later I found he was applying it directly to the antrum in abscess of that sinus, and intends publishing his results. The first case in which I used it was in one of acute infection of the accessory sinuses. The abscess of the antrum resisted all treatment, and, in consultation, opening up of the antrum was advised. As a last resort I prescribed oxygen to be inhaled for fifteen minutes every four hours, and through the affected side. In a few days the discharge was muco-purulent only, and then mucoid. In this case,

after recovery, the affected side of the face failed to clear up on electric illumination.

In chronic cases, where there is a diseased tooth, or where one of the molars or the second bicuspid is gone, I invariably drill up through the alveolar process, making an opening of about four millimetres in diameter. The advantages of the alveolar or Cooper's operation over that through the canine fossa or inferior meatus—the latter Mikulicz's method—is that the antrum is opened at its lowest point, and can be treated more thoroughly and with least pain, both by doctor and patient. In favor of this method would be Zuckerkandl's statement that he found that in most of his specimens that the sinus dipped very low into the alveolar border in empyema of the antrum on account of the most intimate relation with the dental roots. Ziem, of Dantzig, sometimes drills between the teeth on the palatal surface, using very fine burs. He acknowledges that one time he missed the sinus.

There are several anatomical anomalies where Cooper's operation would not be advisable,—for example, where there is a thick alveolar process. Zuckerkandl states that a normal maxillary sinus terminates inferiorly on a horizontal plane passing through the floor of the nasal fossa; therefore, the higher the palatine vault the higher the floor of the sinus will be situated and, in consequence, the thicker will be the alveolar border.

The alveolar operation would not be advisable where there is a flattening of the antrum laterally. Hajek has observed that in these cases there is usually an exaggeration of the concavity of the external wall of the inferior meatus corresponding to the effacement of the canine fossa. In one case, where the alveolar ridge was very thin from long absorption, I commenced the drilling above the edge and on the buccal surface of the alveolus.

When the teeth are perfectly sound I select the canine fossa for the point of operation, making an opening about three millimetres in diameter, directing the bur upward, backward, and slightly inward, having previously incised the mucous membrane. The opening is very rapidly made, as the wall of the antrum is here very thin. The bleeding and the pain are slight in comparison with that in the operation through the inferior meatus. It is also advisable where there is reason to suspect that a more extensive operation will have to be performed for curettement and removal of polypoid growths. Its disadvantages are the temporary swelling of the face after operation, and that syringing here is more painful than through an alveolar opening.

Zuckerkandl, as the result of his anatomical studies, advises opening into the maxillary sinus through the inferior meatus, puncturing as far posteriorly as possible where the wall is thin and immediately below the line of insertion of the inferior turbinate. Dr. Freeman, of Philadelphia, has met with much success with this method of treatment. The difficulty with which the after-treatment is carried out seems to me the greatest objection to this operation. The operation itself is attended with considerable hemorrhage, and where the nostril is narrowed from deviation or spur of the septum, opening up the antrum, either by trocar or drill, becomes difficult if not impossible. The naso-antral wall may be so thick that a bur would penetrate with difficulty, and Krause's trocar not at all.

Sometimes the antrum is situated high up and backward, when an opening made in the inferior meatus would in all probability penetrate into the canine fossa, or if the antrum is narrow, even if the puncture is made far back, the drill may pass through the antrum and into the canine fossa. This narrowness, as before stated, may be suspected where there is an exaggerated concavity of the wall of the inferior meatus, or, according to Gougenheim, where there is marked flattening of the palatine vault.

After opening up the antrum the cure of the sinusitis will depend greatly upon the thorough and regular flushing out of the cavity. I find it is advisable to have a detachable canula that remains in the sinus during the syringing. After this has been done I get rid of the solution left in the cavity by injecting air, either by means of the syringe or a Politzer bag, and then insufflate powder. If the case promises to be of short duration, an ivory plug is introduced; otherwise, a tube of silver or platinum.

If empyema does not yield to these measures, then it will be advisable to make a large opening through the canine fossa to treat a possible necrosis or polypoid growth. Luc completes this operation with a counter-opening made through the inferior meatus with a Krause's trocar, introduces a tube, and allows the canine fossa to heal over. He claims for this method rapidity of cure.

After the sinus is curetted it should be tightly tamponed with iodoform gauze, which should be allowed to remain in for forty-eight hours.

In the first two cases in which I curetted the antrum to remove polypoid growths I chiselled away the anterior wall of the antrum; in the third case Dr. Cryer kindly operated for me, with burs and handle of his own invention. The operation was done with great rapidity, and with much less traumatism and hemorrhage.

Scheich makes a large opening through the alveolus, and packs with gauze two centimetres in width and with a selva on both edges.

At birth the maxillary sinus is merely a small opening, extending laterally. From this time until seven and a half years of age, according to Bourgeois, these cavities become notably enlarged. During this period the relation of the teeth to the antrum is variable; for example, the relation of the second premolar to the antrum of Highmore in an infant at term is much nearer than in a child at seven and a half. Moure, in an article on "Empyema of the Antrum in Children," quotes two unique cases of antral abscess in infants three weeks old,—in both there was a premature eruption of a tooth,—and states that this affection is quite common in children of seven years of age and over.

In a specimen I will show to-night we have both the sinuses encroached upon by an excessive concavity of the walls of the inferior and the middle meatus. This lack of absorption sometimes shows itself in the antrum by the presence of bony or membranous partitions.

The anomalous openings that have been found to exist between the frontal and antral sinuses have given rise to the question whether some of our intractable cases of empyema of the antrum are not due to a frontal abscess discharging itself through the antrum. Dr. Fillebrown, of Boston, gives a diagrammatic drawing of the infundibulum, continuing as a half tube, which terminates directly in the foramen of the maxillary sinus. This half tube, I suspect, is what the French term the *gouttière de l'infundibulum*, or groove of the infundibulum, to distinguish it from the infundibulum proper. Paul Raugé writes that the term infundibulum, meaning a funnel, should be reserved for that canal that passes from the frontal sinus through the anterior ethmoidal cells; this canal at its narrowest portion becomes continuous with the apex of another infundibuliform canal,—the *gouttière de l'infundibulum*,—the whole having the form of an hour-glass. The canal of the infundibulum, however, is not, like the infundibulum proper, a complete cavity, as on its upper portion it is open its full length,—the hiatus (or cleft) *semilunaris* of Zuckerkandl. It is a channel formed in the external wall of the middle meatus, having for its upper boundary the bulla ethmoidalis and for its inferior edge the unciform process.

In the floor of this groove of the infundibulum, below and anterior to the bulla ethmoidalis, is to be found the constant opening

into the maxillary sinus. The opening is so situated in the floor of a narrow channel that, as Raugé writes, it is much better disposed to lead into it liquids flowing from the frontal sinus than to evacuate into the meatus those which come from the antrum.

Clinically, I have very frequently found associated abscess of the antrum with ethmoidal disease. Curnow, of King's College, London, has occasionally found that a direct communication exists between both the anterior and posterior ethmoidal cells and the summit of the antrum. I am inclined to think that ethmoiditis plays a very important rôle as a primary source of infection both in empyema of the antrum and the frontal sinus,—in the case of the antrum by flow of pus into it through anomalous openings, and in that of the frontal sinus by extension of inflammation through fronto-ethmoidal cells and the blocking of the infundibulum by polypoid masses.

PHYSICAL CONDITIONS THAT DETERMINE CHOICE OF FILLING-MATERIALS.¹

BY S. BLAIR LUCKIE, D.D.S., CHESTER, PA.

DIFFERENT materials are in use for repairing the loss of tooth-structure and arresting the progress of dental caries. That no one of them possesses all the necessary properties of a perfect filling is evident, as frequently all are seen in the same mouth, and within the last few years two will be employed in the same cavity with supposed advantage. There must therefore be something to determine the use of one material in preference to the others.

We are all familiar with the expressions "that teeth are too soft or too poorly calcified to be filled with metals, particularly gold; that children's teeth should be filled with plastics until they become sufficient in strength and density to bear filling with some more indestructible material; and the much emphasized remark of the new-departure tripod, in proportion as teeth need filling gold is the worst material to use." "Chalky teeth," "frail teeth," and "soft teeth," and the terms used to designate an opposite condition, such as "hard teeth," "dense teeth," and "strong teeth," seem to express the conditions found at different periods of life better than otherwise could be done, as by long use they have be-

¹ Read before the Academy of Stomatology, February 22, 1898.

come familiar exponents of a knowledge obtained from clinical observation.

Assuming that physical conditions should determine the choice of filling material, it may rightly be said that the selection of the proper material with which to fill the cavity constitutes the key-stone of operative dentistry, for one who masters the art of determining the condition that indicates what to use is not only skilled in the treatment of dental caries, but has acquired a knowledge of the principle of operative practice.

The conditions that determine the choice of material with which to fill a tooth are general and local. The general conditions, such as physical weakness and an inability to control one's self, or be influenced by the efforts of the operator in that direction, are as important in the consideration as are those conditions found within the tooth itself. The divisions of general conditions are approximately related, one may be dependent upon the other, but patients in either condition may be nervously exhausted by dental operations of a protracted character. Much may depend upon the skill and the ability of the operator to manage such patients, but it must be remembered that the liability of individuals to nervous exhaustion, shock, or collapse from physical or psychical impressions, is not governed by any known law, the consensus of opinions of those surgeons who have studied its causes being that persons are most liable to suffer from it whose nervous system is already in what, for a more appropriate name, is called a state of depression, or if mental perturbation, as fright, precedes an injury or operation, the effect may be the same, though health had been enjoyed up to the time. So collapse or shock is considered of two kinds, mental and corporal. In the first the person may be, to use a common phrase, more frightened than hurt, yet the results may be as serious as though produced by physical injuries. Instances are on record where very slight or no physical injury was received, yet fatal results followed. So mental impressions are considered as potent to give rise to prostration varying in severity as that of traumatic origin. The method of inflicting the injury is important in determining the degree of shock, but fear or terror has as great an etiological importance in its production. In railroad accident, for instance, where no physical injury was received the fear subsequent to the accident has so disturbed the equilibrium of the cerebro-spinal centres as to produce a degree of shock of more than ordinary severity and duration.

As shock has occurred after prolonged dental operations, it is

essential that the dentist should consider the tax upon the nervous system of his patient, and for their welfare refrain from operations the protractions of which, through conditions either permanently established in the make-up of the individual or caused by temporary impressions, might produce this undesirable condition, with all its varying discomforts and consequences. Sufficient warning has been given the profession by Dr. Black in the "American System of Dentistry," and by Dr. James Truman in a paper read before the Odontological Society of Pennsylvania a few years ago upon this subject, each dwelling particularly on the condition of prostration following prolonged dental operations. I have, however, been sufficiently impressed with the importance of considering the liability of shock to those patients who have a dread that cannot easily be modified, and who, we are certain, are more frightened than hurt. While their teeth may be in a good condition to receive gold fillings, and be the better preserved thereby, unless fears can be allayed, such permanent work should be substituted by plastics, to be renewed when deficient, or more permanently filled if confidence is gained.

Of the local conditions that determine the selection of filling material may be mentioned the size of cavity, location of cavity, and the organic matter within the tooth. All things being equal, location and size of cavity receive treatment according to manipulative ability and skill; inaccessibility may be readily overcome by one who studies methods to remove obstacles, and thus, to him, fewer interferences occur to hinder than one who recognizes the way to pass obstacles is to use a material of easy introduction and of rapid manipulation. Of local conditions, the organic matter in the tooth is the most important to consider, whether it be that of the pulp or the dentine. If the pulp is encroached upon to such an extent that its life is in danger, plasticity, with protection to the organ, and antiseptics are the requirements, that vital force may have the fullest opportunity to assert itself to make repair. The organic matrix is probably the part that is attracting the most interest and should bring out liberal discussion, for by it are produced the varying conditions observed in the dentine at different periods of life, and which find expression in the terms "hard," "soft," and "poorly calcified" teeth, and also because these conditions seem to have been assailed. Vital properties possessed by the dentine have modified and at times arrested the invasion of caries; and cavities treated by plastic filling-material have produced a change in the resistive power of the whole tooth.

Dr. Black astonished the profession a few years ago with the remark which occurs in his summary of conclusions resulting from a series of experiments concerning the physical character of the human teeth: "There is no basis for the supposition that some teeth are too soft or too poorly calcified to bear filling with gold, or other metal in use for that purpose, since all are found to be abundantly strong," and on page 414 of the *Dental Cosmos*, in which the article appears, he says, "In comparison with the best of granite, dentine is more than one-third stronger," and on page 402, "The greatest good that I could expect to come from this laborious investigation (except as it may affect future studies of caries of the teeth) would be the general abandonment of the idea that the teeth of any patient are so lacking in density as to interfere with reasonable filling operations, with any of the materials now in use. . . . It must, of course, be understood that there may be, and often are, reasons for not immediately using metals in this or that case. The teeth may be hypersensitive, a child may be too young to bear such operations, but the reason for deferring them is not to be found in the softness of the teeth."

To many this seems to be an assertion antagonistic to generally accepted opinions. Yet Dr. Black has presented his conclusions and given the extent as well as the thoroughness of his investigations in a manner that for a long time hardly more than a murmur of non-acceptance could be observed. That Dr. Black has placed himself in a position of safety by allowing a loop of escape is evidenced by the modification that accompanies his expressions. In the last quotation this can be observed in the words, "It must, of course, be understood that there may be, and often are, reasons for not immediately using metals in this or that case. The teeth may be hypersensitive, a child may be too young to bear such operations." It is here, to my mind, he brings us to a point where clinical experience and the results of his investigations may be made to agree, although he does not define his agreement.

The clinician, when he expresses his opinion of the physical state in the terms "too soft" or "too poorly calcified," receives this impression from the condition of the vital portion of the dentine, and Dr. Black, when he qualifies his remarks by the use of the words, "It must, of course, be understood that there may be, and often are, reasons for not immediately using metals in this or that case," recognizes vital conditions and their influences upon the teeth for strength and resistibility to caries, for on page 392 he also says, "After the work I have done with the teeth, I have come to regard

the organic matrix of the tooth as much more important than I had formerly considered it. The conditions of the organic matter seem to have much to do with the strength of the tooth, and is a matter that needs further investigation."

Dr. Black's tests show that the teeth of the young are the strongest, as nearly all of the high crushing stresses were found in teeth of young people, and this strength not dependent either on the density or the percentage of lime salts, as density and percentage of lime salts was found to increase with age. From which he deducts the conclusion that the strength seems to depend upon the condition of the organic matrix. It has for years been the practice to treat the teeth of children with plastics until there apparently resulted a changed condition of the dentine, and although in conclusions twelve, thirteen, and fourteen we are to accept "all teeth as abundantly strong to be filled with gold or other metals in use for the purpose," and "what basis there may be for the selection of filling-material is not in the tooth being too frail or too poorly calcified," and, with such knowledge as the investigation has given us "the only basis for the selection of filling-material to classes of cases is the individual operator's judgment as to which he can so manipulate as to make the most perfect filling, considering circumstances, his own skill, and the durability of material." This would indicate to the inexperienced practitioner that with the ability of young patients to endure the tax of a gold filling, it would be just as well to insert a good non-leaking, well-anchored gold filling, and rest assured the best service was given the patient. Compare this with the plastic treatment and it is reasonable, by the knowledge of experience, to conclude that the latter treatment would best conserve the purpose of tooth-filling. By experience as well as by Dr. Black's investigations the conclusion is that the organic matrix of the dentine is of great importance.

It requires but a few years' experience in the practice of operative dentistry to discover that fillings in teeth produce a change in the dentine surrounding them. Where plastics are used we expect to find the dentine, when the proper time arrives for a renewal of the filling, to indicate by the sound of and the sensation transmitted by the cutting instrument, when its edge is passed over the surface, that the conditions are such that material requiring more energy and force to introduce can now be used if other considerations are favorable. On the other side, when teeth of the young with cavity filled with gold, that require force to adapt to the walls, are seen with darkened dentine around the filling, indicating physi-

cal injury to the living matter, varying from a short distance from the filling to the disturbance of the function of the pulp. And upon the removal of the filling instrumentation designates a less favorable surface of dentine against which to adapt gold.

Facts that are accepted and demonstrated by scientific investigations with instruments of precision have been announced, perhaps in a suggestive way or what might be plausible to consider, before it was possible to make the instrument with which to demonstrate the facts. Dr. Maynard announced the existence of the dental fibrils before they were discovered by the aid of the microscope. His announcement was based upon the knowledge that dentine could be cut with less pain in a certain direction than in opposite ones. Unfortunately for the obtaining of correct data, investigations such as Dr. Black's must be made from teeth out of the mouth, and the question, What changes occur from the time the vital connection is severed until the experiment can be performed? is pertinent in the discussion. All the sections of dentine in the investigation were lifeless, and on page 412, under the title, "Pulpless Teeth," are these words: "The majority of pulpless teeth coming into my hands wore of fairly bright color, indicating that the pulp was recently dead. These presented no special differences in physical character from those with pulp-tissue intact. But those muddy in color, especially if markedly discolored, showed constantly an additional percentage of water, and the few of which I had the opportunity to test the crushing stress broke below two hundred pounds, showing a marked loss of strength." This was attributed to decomposition of the living matter. What effect the living plasmic material that invades the dentine has upon the strength and density of the tooth has not been proved by the investigations, but clinical observation has long satisfied us, like Dr. Maynard's observation, that the teeth are made more strong and dense and possessed with more resistive qualities by being filled with a material that is in consonance with its physical condition; and when further investigations that Dr. Black refers to are completed there may not be any difference between accepted views as regards the organic matrix and the conclusions of such investigations.

Dr. Black's work cannot be exaggerated for its exactness and magnitude or the value it possesses to the profession; there are many parts to it for study and discussion, and the part I refer to to-night is not exhausted. The whole profession is indebted to him for the undertaking. From a study of it we are stimulated to think more highly of our work as artisans and physicians of the mouth. In

the selection of filling-material, however, the choice must still rest upon the basis that clinical experiences have taught, and whether it be of gold, cohesive or non-cohesive, amalgam, tin, gutta-percha, and the various cements, or two in combination, the physical conditions of the patient and of the tooth are as important to consider as skill and ability of manipulation, and the patient is best treated when one is not overshadowed by the significance of the other.

AMERICAN DENTISTRY ABROAD.

BY L. C. BRYAN, D.D.S., F.B.D.C., ETC., BASEL AND DAVOS, SWITZERLAND.

HAVING figured for some years on the staff of your journal as foreign correspondent, I take the liberty of exercising my function in calling your attention, and, through your widely circulated columns, the attention of the dental public at large, to a matter of universal importance to all American dentists at home and abroad. We have watched with growing interest as the years have passed the important improvements in the status of American dental institutions of learning, and especially of the ever-growing importance of the National Association of Dental Faculties, and the good work it is accomplishing in an ever-increasing sphere of importance and usefulness and ever-rising standard of requirements.

As usual, America is still in the van in this as in all dental matters, and I do not know that any such powerful organization in the sphere of education exists elsewhere in the world, and certainly nowhere with such a wonderful future for usefulness before it. It is an organization unique and wonderful in its conception and development, and its importance as a means of regulating and controlling the elaborate system of American dental education is perhaps not generally understood. In a few years this organization has taken unto itself one by one every college of any note in America, so that now if there is any question of the standing of any dental college the only thing necessary to do is to turn to the list of colleges in the National Association of Dental Faculties, and if its name is there no further questions are asked. "Race, color, or previous condition of servitude" (to any former clique controlled by money-making managers) has now no bearing on the standing of a member of the Association. Its standard is known, published to the world, and its members must live up thereto. A new era

has opened for American dentistry. The great trusts set the example of what could be done by concerted action and co-operation, and the dental colleges have taken all the good there is in a trust organization, and dentistry does not yet know what that may bring forth for good. Colleges that a few years ago were open to any plausible business proposition from a young man with cash are now enrolled under its rules and regulations, and the young man with cash and his business proposition is simply shown a list of requirements of the National Association of Dental Faculties, and has to accept the terms it proposes; and has no other alternative. This is remarkable, considering that a few years ago he could, by judicious "shopping" and with a proper tip from a friend or two, have made his own terms with some very respectable and old institutions of dental learning. Now, if this young man without any qualifications but cash arrives on a European steamer too late for matriculation and applies for admission to the "oldest" dental college and is refused matriculation, and then succeeds by "gross misrepresentation" (?) in getting matriculated across the way in a highly respectable university, and writes home to his friends that he is in the senior class of that highly respectable university, with two hundred and fifty dental students, and will be back in June with an American diploma, it is only necessary for those interested in the good name of American dentistry to protest and give the facts to this great National Association, and the young man is within a few days reduced to the rank of freshman, and writes home that he will not return to his friends for three years. And this year the highly respectable university may be called on to explain to the Association how the young man could be matriculated at all after arriving by the European steamer on the afternoon of October 24 and having been refused matriculation in the oldest on October 28, and if it cannot explain how this happened there will be trouble ahead for the highly respectable university.

At the last meeting of the National Association of Dental Faculties a committee was appointed to investigate the requirements of foreign dental institutions, with a view of getting recognition of the American degrees by foreign countries and *vice versa*, and of acquiring other information, and this it is doing in an energetic manner through Dr. Barrett as chairman. The work of this committee, if anything is accomplished, will be the most important in the history of the Association. I have suggested (see *Dental Review*, February 15, 1898) that one of its first functions should be the selection of preliminary examiners, one or more in

each foreign country, as may be decided, and each applicant for admission to American dental colleges shall bring a certificate from the examiner in his country as to the value of the certificates he presented, as judged by American standards, which will be set by the Association. Should the candidate be or have arrived in America, his certificates shall be submitted to the examiner of his country before matriculating him. These examiners will inform candidates into what class of any American college in affiliation with the National Association of Dental Faculties they may enter, and shall give them letters to this effect, and their decision as to the value of these certificates shall be final. This would prevent "shopping" to secure best rates, and would also prevent much of the easy graduation of foreigners, which has been such a disgrace to the American diploma abroad. The foreigner, in many cases, seeks the school in which he can graduate in one term, and his main object is to return to his own country as soon as possible and practise under the name of American dentist. He does not go to learn all there is to be learned of American dentistry, but merely to get the title as expeditiously as may be, and few of such adventurers have required more than a few months to return a D.D.S., whereas a native American never gets through with less than the whole prescribed course of the college. This is mainly owing to the presentation of certificates in a foreign language by applicants from other countries, with seals and other paraphernalia, which the deans of the colleges have not taken the trouble to investigate or have not comprehended the full value or meaning of. Irregular graduations have of later years become more difficult, but still a candidate seldom fails to find an institution of some kind that will accept his terms, and it is all the same to him whether it is a recognized college, connected with the National Association of Dental Faculties, or a private institution, a free lance, in fact, such as Chicago can now show, which rivals in infamy Buchanan's diploma-mill of accursed memory. I have in my hands now, received to-day from a Swiss college, a circular of one of these Illinois mills.

The great difficulty about the recognition of American degrees by foreign authorities has been the inability to distinguish between high and low standard colleges, and it should be made plain to them that no college is recognized in America which does not comply with the standard of requirements of the National Association of Dental Faculties. Theirs should be the universal standard.

The State Department at Washington should be shown the im-

portance and the influence and position of American dentistry in foreign countries, securing as it does a representative resident in the country, acquainted with its institutions, influential for good among its people, an educated professional man, ready to work for American interests and not changing with every administration, having generally an income sufficient to enable him to invest in his country's industries and enterprises and in this way support them, and finally support himself in comfort in his native land. Senator Hale once said that in all his travels abroad he had found the resident American dentists the best representatives of their country whom he had met.

The American ministers abroad should be instructed as to the values of diplomas of the different institutions, given a list of those which the State boards recognize, or of those which live up to the highest standard, and more important still, be given a list of those which are *not* recognized colleges. These should be communicated to the various governments and to the authorities of the foreign dental colleges, which are just now beginning the work long done by old established American institutions.

The State Department has recently collected, through its foreign representatives, the full text of the laws of all foreign countries, and this is accessible to any one who will write for it to the Department, and is a good basis to work on.

The present standard of requirements of our schools is such, except in preliminary education, that no foreign country can object to receiving our graduates on an equal footing with their own and giving them equal privileges, which few, if any, in Europe now do, so far as I know. When the preliminary studies standard is raised there will be no possibility of refusing our graduates.

The laws as laid down in most countries are almost exclusive; but if a man has the means to live and the will to study he may overcome all difficulties, and good operators will always find a good opening, if not as an established dentist with full rights, at least as assistant.

The requirements in several countries, as will be seen in the March number of the *INTERNATIONAL DENTAL JOURNAL*, is the possession of a medical diploma. This means three to seven years study in the country and a good previous education. However, in countries like Austria, a good American dentist can associate himself with a medical man of the country and practise dentistry with great profit and success. In these countries, if a medical man is unsuccessful as a physician, or has a taste for dentistry, it is a common

custom for him to set up as a dentist without further study of the diseases of the mouth and teeth than he can get out of such textbooks on this specialty as his country affords. What a blessing for his patients could he secure as assistant the services of a thoroughly trained American dentist! And this they often do if one is available. Salaries in Europe are from fifteen hundred to three thousand dollars, and some assistants make from four thousand to five thousand dollars on shares, when capable.

Any one can establish himself in Germany and put out his plate as Amerikan dentist (with a k), but must not call himself doctor or Zahnarzt. The Zahnarzt is one who has passed his examinations in Germany and has rights as a doctor. The right to labor is free to all (*Gewerbe Freiheit*).

Switzerland requires a preliminary education called the "maturity," "made in Switzerland," which is about equal to our B.A. degree, and necessitates a residence in the country of from one to four years, long enough to learn either the French or German language, and then to make the studies prescribed for the maturity. After this is met the dental examination consists in passing in certain medical and other scientific branches, and putting in three fillings, one of which must be gold, and making a plate. Former home studies are not given credit for, and *all* must be made in Switzerland.

The Medical Council or Leitende Ausschuss have had the option of giving the maturity, but this favor is only granted to Swiss, and *all* must be able to make a simple gold filling, etc., and pass the practical examinations in full.

One advantage foreign schools have over American ones is that if they do not all teach *dentistry* as fully and successfully as American colleges, they require a higher standard of preliminary education. Ours have looked more to the making of practical dentists than to the turning out of highly educated professional men, and in this respect we could learn something from the foreign colleges.

As long as American colleges recognize the degrees of foreign dental colleges and allow applicants from them to enter the senior class while possessing only foreign diplomas, there will be no chance for the recognition of American degrees in the countries where they are now not accepted, and where the American dentist, with his D.D.S. has to make the whole studies from the beginning, with the difficulties of language in his way; and we can get no reciprocity as long as this condition of things exists. American graduates must make the full course in any of the institutions here I know

of, and must make their preliminary examination, "the maturity," and something ought to be done so that American graduates, fully equipped for their profession, shall be admitted on more favorable terms to a course in a foreign college, or else some course of study should be prescribed to the foreign student in America equal to that imposed on Americans abroad generally, if we cannot raise our own preliminary standard higher just yet. But why not?

Therefore I say that the work of the National Association of Dental Faculties committee is very important and has a great task ahead of it, which, let us hope, it may accomplish to the end that Americans may find a foothold in foreign countries where recent laws have made it almost impossible for them to enter, and agitations are going on to increase the difficulties even more for the "foreigner" from America.

Abstracts and Translations.

THE ADMINISTRATION OF ANÆSTHETICS.

UPON this topic, one of cardinal importance to every practitioner of medicine, there have lately appeared in the London *Lancet* three lectures delivered by Frederic Hewitt, based generally on a wide experience as an anæsthetist, particularly on six thousand six hundred and fifty-seven administrations of anæsthetics conducted at the London Hospital during the year 1897. On the first of that year Hewitt adopted a system of recording the cases of anæsthesia, providing books and special tabular forms so that every instance of the administration of the narcotic in any part of the hospital could be properly noted. It is interesting to observe that out of the total number of cases nearly three thousand were of ether and more than one thousand of nitrous oxide. Chloroform was relied on solely in six hundred and seventy-seven cases, the A. C. E. mixture in five hundred and ten, ether followed by chloroform in two hundred and ninety-three, nitrous oxide and oxygen in two hundred and forty, and other successions in the majority of the cases unaccounted for. It will be noted that Hewitt has not confined himself to any particular method, but has had a sufficient clinical experience to speak with authority upon nearly all the combinations in common use.

As to chloroform, he states that within a few years it was the anæsthetic in routine use, but that confidence in it has been shaken by experience. He particularly warns against the employment of certain recently devised chloroform inhalers. He states that for giving chloroform in the ordinary routine way there is nothing better than Skinner's mask.

Referring to the general effect of chloroform as an anæsthetic, Hewitt states that, other things being equal, the stronger the patient the greater the trouble in giving the anæsthetic. Deaths from chloroform are the most common in the middle period of life, when men are most vigorous, and more men die than women under this anæsthetic. The drug is most lethal during the early stage of its administration, and a very large proportion of the accidents have occurred in connection with minor operations, which are most common in vigorous subjects. The explanation of this is dependent upon the fact that during the transient, very imperfect anæsthesia, the muscular system is thrown into a condition of spasm, most marked in the most powerfully developed.

Hewitt states that there is much to be said in favor of the use of ether and chloroform in succession. The stage of rigidity and excitement, which is the dangerous stage in chloroform, is safely passed over under the stimulant effects of ether. Having secured a proper degree of ether anæsthesia, chloroform may be substituted, and there will result a better type of chloroform anæsthesia than if this drug had been given from the beginning.

Hewitt has adopted this principal for several years and is able to use chloroform without the occurrence of those untoward symptoms which are bound to occasionally arise when this agent is given from the commencement of the administration. He regards this development in our methods as one of the most important of recent years. It is especially indicated when ether causes cough, embarrassed breathing, or the secretion of much mucus, or when the operation is likely to be a protracted one. Some practice is needed to know when and how to effect the change. The rule to follow is, there should always be some evidence of the patient having emerged from ether anæsthesia when the chloroform is applied. As a rule, the conjunctival reflex should be present when the change is effected, and in abdominal operations this change should be made before the operation is begun. Very little chloroform will be required to keep up the proper degree of unconsciousness.

As a result of a very large experience Hewitt uses much less ether and much more chloroform than formerly. He holds that it

is as safe to keep up the anæsthesia of chloroform as that of ether, and that the risk of subsequent bronchial and pulmonary complications is undoubtedly reduced. He has often anæsthetized according to this procedure the patients in the sitting posture, and in not a single instance has he been compelled to place them horizontally.

By his arrangement of cylinders he is able to administer nitrous oxide and oxygen in combination and to keep up the anæsthesia for an almost indefinite time. The method is the safest at present known and is devoid of after-effects. The anæsthesia is not so deep as that of other agents commonly employed; the muscular system is not so completely relaxed; nor is it possible always to completely abolish reflexes. He is not satisfied with it in severe surgical cases. His best results have been with rather debilitated women or children. Robust and vigorous male adults, especially those of alcoholic habit or excessive smokers, are not good subjects. In one case of breast excision, in which the anæsthesia was kept up for thirty-five minutes, a good deal of vomiting followed.

Hewitt's observations concerning the use of nitrous oxide before ether are especially serviceable. This plan of anæsthetizing is at times inapplicable and unsuccessful. Cases are seen in which there has been a narrow escape from fatal asphyxia. Muscular men of middle life who have become rather obese should never be anæsthetized by this method. If it is employed only a small quantity of nitrous oxide should be used, and ether should be gradually added to it. The plan of administering a full dose of nitrous oxide and changing to ether is, however, very useful in children and in women, provided that there are no contraindications to either in the patients.

The use of nitrous oxide, ether, and chloroform in succession is warmly commended. The initial anæsthetic, nitrous oxide, rapidly destroys consciousness and prevents struggling. The intermediate anæsthetic, ether, is useful because the circulation will remain unimpaired by the strain imposed upon it should rigidity or suspended breathing arise before deep anæsthesia, and because the stimulant effect produced by the ether lasts for a considerable time while chloroform is being given. Chloroform is administered because of the quiet and deep anæsthesia which it produces, because of its great convenience, and because of the rarity with which bronchial and pulmonary after-effects are met with after its use. Hewitt states that, given no special contraindications, there is no better plan of anæsthesia than this.

The A. C. E. mixture he commends for middle-aged and powerfully built men, with double chins and thick necks. It is first dropped upon an open Skinner mask; after a couple of minutes a Rendle mask with more of the mixture upon it may be substituted; and immediately any rigidity begins to show itself the Rendle mask may be exchanged for an Ormsby inhaler charged with ether. By this plan he has been enabled to successfully anæsthetize without any difficulty many such subjects.

Of the total number of cases anæsthetized by Hewitt, there were thirteen which exhibited threatening symptoms. The four factors giving rise to dangerous symptoms are, he states, the anæsthetic itself, the state of the patient, the posture of the patient, and the surgical operation.

In the first case which exhibited dangerous symptoms, breathing stopped before the patient was thoroughly anæsthetized. As the patient was greatly cyanosed, ten ounces of blood were drawn, and the breathing immediately commenced. It is very common, just before anæsthesia is established, for the breathing to become temporarily suspended. This is due to acts of swallowing, which are more tardily performed than when consciousness is intact, thus closing the glottis. In addition there may be general muscular spasm. In the vast majority of cases this impaired breathing comes on just before stertor and passes off spontaneously, or may be made to do so by removing the inhaler, rubbing the lips with a towel, or pushing the lower jaw forward. In more obstinate cases, in which the jaws are clinched and the neck muscles are rigidly contracted, it may be necessary to separate the teeth and to pass the finger to the back of the pharynx, when breathing will recommence. Unless this condition is remedied it may pass on to a dangerous or even fatal degree of asphyxia.

Of the six thousand six hundred and fifty-seven cases of anæsthesia, there were only three in which the anæsthetic could in any way be held responsible for the fatal issue, and only one in which the anæsthetic was the sole factor.

In a case of appendicitis following typhoid fever the patient apparently died of bronchopneumonia thirty-four hours after operation. Hewitt holds that the chances of pulmonary complications would have been less if chloroform or the A. C. E. mixture had been given, and that from this experience it is fair to infer that the unusual cyanosis met with during the administration might with advantage have been taken to indicate that a change from ether to chloroform should have been effected.

The immediately fatal case occurred under chloroform and during the period of preliminary excitement.

As to the gastric after-effects of anæsthetics other than nitrous oxide, in two hundred and seventy-five cases in which this was noticed there were none in one hundred and nine, slight in one hundred and nine, moderately bad in thirty-five, and severe in twenty-two. Calculating on a percentage basis, it is noted that thirty-six per cent. of the ether cases had no after-effects; while thirty-two per cent. of the ether cases followed by chloroform were similarly fortunate; seven and two-tenths per cent. exhibited severe after-effects after ether. Patients are more apt to suffer from slight after-effects when ether has been used, but the chances of protracted vomiting are greater when chloroform has been administered. There can be no doubt that abstinence from food for at least four hours before operation should be enforced. Clear soup or beef tea is the best form of nourishment before operation. The practice of giving a patient beef tea three hours before operation is open to objection. The stomach should not only be emptied, but digestion should have been finished for some little time.

A tabulation shows that the severity of the after-effects is markedly influenced by the continuance of the anæsthetization. As to the prevention of the gastric after-effects, in addition to previous regulation of the diet it is essential that the bowels should be thoroughly evacuated; this is accomplished by administering a purgative on the night before the operation and an enema on the morning itself. The patient should be rendered anæsthetic as rapidly as possible; a deep anæsthesia, free from swallowing movements, should be maintained. The head should be kept to the side for the escape of mucus and saliva, and the mouth should be frequently wiped out. The patient when in bed should be turned well upon his side and the bed should not be moved, and the room should be kept quiet. No nourishment should be given until the patient himself asks for it.

If nausea, retching, or vomiting be present the patient should be given at intervals two or three ounces of very hot water to drink. The taste of ether is best overcome by moistening the lips with lemon juice. If there appears to be a neurotic element present, enemata of twenty grains of bromide of potassium in two ounces of water will often answer well. The inhalation of vinegar from a towel is very useful in arresting vomiting, as is also the application of mustard leaf to the epigastrium.

This communication of Hewitt's is extremely important, as it is

founded upon the careful, minute, detailed observation of an accomplished and widely experienced anæsthetist. The diversity of his methods and the multiplicity of his apparatus do not commend themselves to an American surgeon. One important lesson, however, taught by his paper is that there are merits in ether, chloroform, and nitrous oxide; that each has its appropriate place in surgery; and that in place of the slavish adherence to routine it would be wise to judiciously select in accordance with the condition and temperament of the patient. His practical observations upon certain difficulties that arise during anæsthetization, his strictures concerning the employment of chloroform and nitrous oxide in the robust, are useful. His reasons for substituting ether by chloroform will scarcely be conclusive to American surgeons, save in exceptional cases,—i.e., those with a tendency towards pulmonary congestion. Under such circumstances the following of Hewitt's plan may well be commended.—*The Therapeutic Gazette*.

Reports of Society Meetings.

ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

A STATED meeting of the Odontological Society of Pennsylvania was held at 1415 Walnut Street, Philadelphia, February 12, 1898, at eight P.M., President Brubaker in the chair.

In the regular order of business the chair appointed Drs. Broomell and Warren as a committee to take action on the death of our esteemed member, Dr. Alonzo Boice.

A paper on "Empyema of the Antrum" was then read by Dr. Ella E. Musson.

(For Dr. Musson's paper, see page 496.)

DISCUSSION.

Dr. Cryer.—I am interested in the subject of Dr. Musson's paper, as it is closely related to the studies I have been making for the last few years upon the relation of the teeth with the floor of the maxillary sinus, the shape of the sinus and its outlet into the nasal chamber, and the relation of the outlet with the frontal sinus through the hiatus semilunaris.

The essayist has shown specimens and illustrations which do

not agree with the general text-books upon anatomy. Anatomy is generally taught as an exact science in our books and by teachers, but from the special or surgical point of view it cannot be properly so classed. I do not mean by this that there is not such a regular basis of anatomical science that certain rules and types cannot be made and followed, but the more closely we study the subject the more variations as to detail we are compelled to record. There are as many variations in the internal anatomy of individuals as there are differences in their external appearances; especially is this true concerning the anatomy of the head, modified as it is by age, disease, occupation, climate, race, and other conditions. I can certainly agree with what the essayist has said in speaking from her own experience, either from clinical observation or her own anatomical dissection, but I do not agree with many of her quotations, among which may be mentioned the following:

Hajek thinks the pain in acute abscess of the antrum "is greatest with a thin floor, as the dental nerves are thus in close relation to the mucous membrane of the sinus." In normal anatomy the superior dental nerves and vessels pass in a groove which extends from the internal opening of the posterior dental foramen horizontally to the anterior portion of the sinus. The groove terminates into a canal or canals through which the nerves and vessels pass to the anterior teeth and surrounding tissue. From this groove branches are sent out for the accommodation of nerves and vessels going to the roots of the various teeth in this region: occasionally these grooves may be lost in small canals for a short distance. The nerves and vessels are only covered by the muco-periosteum. Any disease of the antrum, whether the floor be thick or thin, is liable to interfere with the normal function of these nerves and vessels.

I must also take exception to the statement that "Gavel diagnoses antral abscess by syringing it out through the ostium maxillare, having succeeded in passing the catheter in twenty-eight cases out of forty." The statement that an irrigating catheter is so passed may sound or read well, but in actual practice it is out of the question. It cannot be passed in normal cases. Of course there are cases where a catheter can be passed from the nose into the maxillary sinus, for at times there are abnormal openings, either pathological or traumatic, and even the greater portion of the division between the antrum and the nose has been lost in some cases. In these there is no difficulty in washing out the sinus.

The method of Dr. Moll, given at the last annual meeting of the Dutch Laryngological Society, consists of the "aspiration of the

contents of the accessory cavities by a forcible inspiration, while the mouth and nose are firmly closed. In this way the chest is inflated, and there is considerable diminution of pressure in the accessory cavities." Dr. Moll may, by some mysterious method, be able to inflate his chest with his mouth and nose closed. It would be interesting to have the exact technique of this method made public.

The essayist speaks of a large antrum on one side associated with a small one on the other. To account for this and other variations it is necessary to understand the development and the growth of the sinus.

The maxillary sinus varies in shape, size, and thickness of its walls according to age, race, and presence or absence of teeth and tooth-germs within the jaw of each individual. The capacity varies in different subjects, and in the two bones of the same subject. The development of the sinus begins about the fourth month of gestation by an invagination of the lining membrane of the nose within the hiatus semilunaris. At the time the invagination begins, and until the eruption of the permanent teeth, the greater portion of the axilla is occupied by the dental organs. As the invagination progresses the cancellated portion of the bone undergoes absorption. This absorption of the internal portion of the maxilla is continued in a variable degree throughout life, until, in old age, the walls usually become exceedingly thin. Usually the floor of the antrum in the negro race is much thicker than in the white race, and it is uncommon to find the points of the roots covered only by a thin plate of bone as in the white race. If the intrinsic forces normally related to and operating upon the developing jaws be not interfered with, there will be a normal development of the bone, the sinuses and structures associated with it. But if this harmonious relation of form and structure be disturbed, there will be a corresponding abnormal form to the bone, sinuses and structures associated with it, and in degree proportional to the force applied. This abnormal force can be manifested in various ways,—the lack of proper nourishment and assimilation to the various tissues involved. Diseases of the soft parts often change the shape of bones, particularly in the young. Aggravated tonsillitis on one or both sides in childhood will, if chronic and accompanied by hypertrophy, cause the roof of the mouth to take an inverted V-shape, and this will influence the shape of the floor and the size of the maxillary sinus. Inflammation in and about the deciduous teeth will induce a vascular excitement that in some cases causes the osteoblasts to

deposit secondary bony tissue through the cancellated tissue, thus interfering with the proper eruption of the permanent teeth either by causing their impaction or their eruption in an abnormal position. A slight disarrangement in early life will cause variations that cannot be overcome at a later period.

I have specimens here that are almost like the drawing shown by the essayist. On one side the antrum extends far below the level of the floor of the nasal cavity, while on the other it does not extend to the level of the floor of the nasal chamber. The nasal chamber on this side extends outward to the external wall of the maxillary bone.

The outlet of the antrum, though not generally so described, is on the superior edge of the inner wall of the sinus, a little anterior to the centre of the edge. It is oval in shape, and permits communication between the sinus and the nasal fossa through the hiatus semilunaris. In many skulls this opening is in direct communication with the frontal sinus and the middle and anterior ethmoidal cells. Occasionally the opening of the sinus is in the roof of the antrum. There are skulls where a probe can be passed directly from the sinus through the hiatus semilunaris into the frontal sinus.

I was in hopes that Dr. Musson would speak of the bulla ethmoidalis. It is situated on the upper portion of the lateral wall of the hiatus semilunaris, and extends upward and inward towards the uncinate process. It contains the middle ethmoidal cells, varying in number and size. Their openings are in the outer and lower portion of the bulla ethmoidalis, and discharge their fluids into the hiatus semilunaris near the opening into the maxillary sinus. It is through the increase in size of the bulla ethmoidalis and of its covering membrane that much disturbance is caused in the anterior and posterior portion of the nasal chambers, the frontal sinuses, and antrum of Highmore.

By its enlargement it presses towards or against the septum, closing the space. When the enlargement is downward it presses upon the unciform process and into the hiatus semilunaris, closing this semicircular groove and preventing the passage of fluids from the frontal sinus and the anterior and middle ethmoidal cells into the posterior portion of the middle meatus, consequently the fluids enter the maxillary sinus, and, through general inflammation of these parts, there is an excess of these normal fluids that cannot find exit. This would interfere with the proper nourishment of the teeth, especially in the white race, and, as has been already stated, the nerves and blood-vessels to the teeth pass on the inside

of the outer wall of the sinus. The excess of fluid without an exit will cause a fulness of all the anterior cells as well as the frontal sinus, and even cause disturbances in the anterior portion of the brain-case. It is this thin blocking of the hiatus semilunaris which causes the secondary or associate opening between the antrum and nasal chamber, which is always found posterior or below the bulla ethmoidalis. I have many cases on record where teeth have been lost by discharges of infected fluids from the antrum along the roots into the mouth.

The President.—The difficulties and complexities attending the treatment of antrum troubles certainly become very apparent. There is a similar but not identical condition of the antrum which might be termed emphysema, which has a great interest for dentists, inasmuch as the cause of it is to be found in the conditions of the teeth which project into the antrum. I will ask Dr. Kyle to speak on that phase of the subject.

Dr. Kyle.—Mr. President, ladies, and gentlemen, I am sorry that I did not hear the entire paper of Dr. Musson on "Empyema of the Antrum." That is one subject at least on which the dentist and the rhinologist are on the same ground. Pus in the antrum differs not from pus in any other part of the body, and if you drain from below the case passes out of the hands of the rhinologists and into the hands of the dentists. I think sometimes we make a mistake in draining from above.

The condition of emphysema of the antrum,—I do not know whether it is a new condition, but I have noticed the symptoms were the same as of empyema. In several cases it was associated with ozæna, in which there was no accounting for ozæna. The ozæna was intermittent. At times it would disappear. In one case I did not refer to the dentist, but opened and found no pus; but there was an escape of gas. There was a fetid odor. In keeping the antrum open the ozæna would disappear. The gas comes from decomposition of diseased tissue. You know that even in decomposition of tissue exposed there is gas formed. And when tissue is decomposing in a closed space there must be an escape for that gas; and that would lead to emphysema of the antrum. In one case where the patient suffered very much, as in empyema of the antrum, the dentist found the tooth was dead, and there was considerable necrosis; and in passing the probe up into the antrum he did not strike pus, but this fetid odor, and after this the symptoms all disappeared. In that case emphysema of the antrum was relieved by the treatment of the tooth. It gives rise very much to

the same symptoms as pus. I believe that in five of the six cases on which I have notes I was wrong in my diagnosis of pus in the antrum; it was due to a lesion in the tooth rather than from any necrotic process. I would like to hear if the dentists have noticed anything similar.

Dr. Peirce.—In listening to the very interesting paper of Dr. Musson and the discussions that followed, I am inclined to think that all of my knowledge and practice is largely empirical. I can readily remember the first opening that I made in the antrum. While having charge of a clinic in 1857, a patient came in with a large tumor under the left wing of the nose. I probed it with a sharp instrument, and found it was a curved root presenting itself under the lobe. I took hold of the root with a forceps and brought out a root of a large incisor tooth, which penetrated the antrum. This extraction was my first experience with the antrum.

Only a few days following a lady presented herself, who said that for some time she had not gone into a stage-coach or parlor without the inmates putting handkerchiefs to their noses. I found she had had a molar tooth extracted, and had had some pain on that side of the face. I made the opening free into the antrum, and found by washing it out that there was considerable pus. By washing a few times she was relieved, and such was the result that some time afterwards when I met her husband he said, "Doctor, I had a very disagreeable wife, and you have given me a very pleasant one."

Since that time I have opened and treated a great many antra. I have always gone into them either over the alveolar ridge or, if I have selected a tooth, the anterior buccal surface of the molar. I have not disturbed the teeth other than treating them.

I had an interesting case this week of a tooth opening into the nares. A physician came to me a few years ago with a broken incisor. I placed on a crown, and it was comfortable for some time, but finally he said that there was a discharge from that tooth. The discharge has continued for six or eight months, and this week the tooth dropped out, leaving an opening from the apical extremity right through to the nares. The trouble ceased at once. I never have treated nor have any knowledge of diseased antra except in treating the teeth.

My friend Dr. Cryer says that there is always a process of bone over the root, but when a tooth has an opening at the apical extremity the tooth will very soon cause the absorption of that very thin bone. The product of decomposition from this dead pulp is

emptied into the antrum directly, and produces no fistula into the mouth. And this gives rise to a diseased condition of the mucous membrane in the nostrils and causes an unpleasant odor. I am inclined to think that a large proportion of diseased antra have come from the teeth. And even though the teeth have been extracted before the diseased antrum goes into the hands of the physician, a diseased tooth has probably been responsible for the condition. That has been my experience, and, I think, the experience of other dentists.

Dr. Cryer.—I would like to answer Dr. Peirce in regard to the absorption of the thin plate of bone that covers a portion of the roots of teeth in the floor and on the sides of the antrum. In the white race the roots of the molar teeth are closely associated with the antrum; there are specimens upon the table illustrating this. It is generally admitted that pus or infected matter will pass in the direction of the least resistance, and by observation it would appear that when infected matter, such as pus, passes out of the apical foramen of the teeth, it would more than likely pass into the antrum instead of through the alveolar process into the mouth. My clinical experience teaches me otherwise,—i.e., an abscess caused from an infected tooth usually makes its fistula into the mouth. The only reason that I can give for this is that nature usually protects weak points in various ways. In this case I believe the mucoperiosteum lining of the sinus takes up its defence, and through its osteoblastic layer builds and protects its wall against invasion through absorption. I have here the right and left superior maxillæ of the same skull, each having a devitalized first molar; abscesses have taken place at the apex of their palatal roots. In the left maxilla the opening has been made into the maxillary sinus, but there is evidence that there has been an attempt to build bone to prevent its doing so. In the right maxilla there is quite an exostosis over the position of the infected root, and by examination of the palatal surface of the root it is found that the discharge of the abscess was made into the mouth, and I believe that is the usual outlet for the apical abscesses, of course recognizing that they occasionally open into the antrum. I believe that diseased antrum more frequently comes from malformed and diseased nasal chambers than from the teeth.

Dr. Warren.—There are one or two points I think might be emphasized in the treatment of this disease. One is the matter of opening at the lowest point. I would like to ask Dr. Kyle why he does not always open at the lowest point. The second is the mat-

ter of drainage. In many cases we find openings made by surgeons or specialists that are packed with gauze; others will use ivory plugs and vulcanite, and occasionally we hear of a drainage-tube. During the last three or four years I have opened a number of diseased antra, both for others and myself, and have found in every case where I have treated them that I secure good results with free drainage obtained by introducing drainage-tubes. These tubes should be so constructed as to be capable of being sterilized and flushed by the patient or some member of his family at least once a day. I use the small sword-shaped drill, following that with a small Morse reamer, and then have my platinum tube drawn to a size that would fit the opening made by the last drill.

The President.—If there is any one else who wishes to speak upon this subject we will be very glad, indeed, to hear from them.

Dr. Cryer.—There is a tendency, however, on the part of some of our rhinologists to make outlets from the mouth into the maxillary sinus, thus giving passage to the fluids, diseased or otherwise, that have passed from the superior anterior portion of the nose and the frontal sinus into the antrum through their inability to make them pass along their normal course. This is not good surgery. The mouth must be kept pure and clean from these foul discharges, and it is the duty of those who care for the nose to treat and cure their special region without infecting the oral cavity.

Dr. Musson.—As to the remarks of Dr. Cryer, I think Zuckerkandl's work does not deserve to be considered antiquated. It dates back only some ten years or more, and the illustrations are all taken from anatomical specimens. They are all plates of conditions as he saw them there. I do not know of any illustrations as beautiful as those of Zuckerkandl. It is possible Dr. Cryer can tell me of some others. Bodenheim's work dates only a few years back. In regard to the position of the ostium maxillare, in all these specimens I have shown to-night they have been up very high on the naso-antral wall, and not low down. The opening that is probed down the middle meatus is generally an accessory opening. As to the probing of the antrum, I have never succeeded but once in doing it. It is often impossible unless, of course, the middle turbinate is removed.

As to the pressure, I think Dr. Cryer hardly did Dr. Moll's method justice. I said both the nose and mouth were tightly closed. Then by expanding the lungs the atmospheric pressure is considerably lowered, and it is possible to draw the liquids up and down.

In 1882, I think, the opening of the frontal and ethmoidal sinuses into the antrum were shown by Mackenzie and Macdonald, of King's College, London. The interesting point in regard to the accessory opening of the antrum is the explanation that these accessory openings are only found in rather old people and due to absorption.

It was Dr. Peirce himself who first taught me that opening through the canine fossa. Of course, I do not know that it is advisable except in a case of long standing. It seems a pity to sacrifice a tooth.

Now, as to the drainage-tubes of Dr. Warren. There are two objections. First, they slip around in the canal, and they tend to cause absorptive abscess. These objections have been overcome by French dentists. They fasten it with bands to the teeth, anteriorly and posteriorly, and a certain amount of fixity is produced. Another objection is that unless one is quite sure of the length he is likely to get it a little too long. If the tube is kept in position while washing a certain amount of pus remains about the end of it. If the tube is too long it is hard to thoroughly wash out the pus. In making the drainage-tubes I have always been careful to pass a probe and mark it off, and have the drainage-tube made of that length.

Dr. Peirce.—I would like to ask Dr. Musson whether persons seem to inherit from their ancestors a tendency to disease of the antrum. Four sisters have been in my hands, all of whom have suffered from this trouble.

Dr. Musson.—I have not noticed it.

Dr. Warren.—Just a word in reply to the doctor's criticism. Of course we always take the measure. In making the perforations we have the lower row enlarged. We are always careful to explore the cavity and mark the probe, and in that way lay out the work. After marking the probe we make it a little longer. As to the movement of the tube, if the suggestion is followed as I made it,—to use the Morse twist drill,—we find that with some little pressure the tube will go to its place, when, if necessary, we can tie it to the teeth. But I have never experienced that difficulty.

Dr. Bonwill.—I did not hear what Dr. Musson had to say, but I read her paper. I think it is very admirably done. I would like to ask the doctor whether she, so young as she is, has had all these cases herself,—whether or not they come from her own practice or from the practice of the dentists surrounding her? for in a practice of forty-three years I have never had but one single case

in my own patients, and that never happened until after the tooth had been treated,—thirty-five years ago. I placed a crown on it twenty years ago, and that crown I had to remove about two years since. Three months ago I extracted the tooth, and I found an opening into the antrum.

I have had a few cases from the hands of others. I think many are due to the stupidity of dentists, and a great deal of it might be obviated. The great thing, when you see a trouble, is to extract a tooth without waiting. This is very largely the practice that I would recommend.

The President.—It has been moved and seconded that we adjourn.

Adjourned.

JOSEPH HEAD, M.D., D.D.S.,
Editor Odontological Society of Pennsylvania.

THE NEW YORK INSTITUTE OF STOMATOLOGY.

A REGULAR meeting of the Institute was held Tuesday evening, April 5, 1898, at the residence of Dr. J. Stedman Converse, 42 West Fortieth Street, the President, Dr. E. A. Bogue, in the chair.

The President.—Our fellow-member, Dr. George A. Maxfield, of Holyoke, Massachusetts, is present, and will address us on the subject of "Hypercementosis."

Dr. Maxfield.—Mr. President and gentlemen, I have not much that is new, but I have thought it might interest some to see the specimens I have in illustration of the subject. I have one case with a complete history from the beginning, and there are two other cases with results that will be of interest. The literature on the subject is very limited, and I was very much disappointed when taking up the study to find so little. The best that has ever been written on the subject is by Professor Guilford, of Philadelphia, in the "American System of Dentistry." There is one point that seems to have been made by all the writers, that hardly any trouble is experienced from hypercementosis except where there is a large deposit of cementum. My experience has been that the trouble comes from the small deposits. Here is a case—the first right inferior molar—in which I am confident I was wholly the cause of the trouble. This patient came to me when I was in college at Philadelphia, and I placed two large gold fillings in each approxi-

mal surface of the tooth. I used Dr. Bonwill's mechanical mallet, and probably, as most students do, used a heavy blow. I never had that feature brought to my attention as it was in our State examinations at Boston last month. I noticed a number of the candidates who were using extremely heavy blows with their automatic mallets. In this case trouble commenced about three months after the tooth was filled. I commenced treatment by making external applications to the gums, then removed one of the approximal fillings, and finally destroyed the pulp and removed it. As the pain still continued after three or four months, I extracted the tooth, and there was the hypercementosis on each root. I am very confident that the irritation caused by heavy malleting was the cause of that deposit.

I have here—Card No. 3—a case of a second bicuspid. This man had a great deal of neuralgia, which commenced several months before he came to me. It would come on in paroxysms, last for several hours, and then stop. At such times he could not tell which tooth was troubling, but the pain was on that side of the face. After studying his mouth I removed this tooth and the trouble ceased.

Another case (I pass around casts made before and after the tooth was extracted). This man came in, having suffered for nine years with severe neuralgia through the front and right side of the face. He wanted the lower incisors removed; it was in the winter, and the cold air caused severe pain in these teeth. After looking over his mouth, I told him I would take a cast of the mouth and study the case. When he came again I removed the first right inferior bicuspid, and there has been no recurrence of the neuralgia.

The lady from whom this cast was made suffered a great deal with neuralgia on the left side of the face, and complained of pain in the ear. At that time I was not able to diagnose the trouble, and did not until a few years ago. One can see that all the trouble must have come from that superior first molar, which had dropped down through loss of its antagonist, and there must have been hypercementosis. The neuralgia and the condition of this superior molar are typical symptoms for the diagnosis of this trouble.

I have here a specimen, an inferior left third molar. This man had been a sufferer from neuralgia for seven years, and had been treated by physicians without effect. After examining the mouth I determined at once what the trouble was and removed the tooth, and his neuralgia ceased. In this case the tooth, instead of standing upright, tipped forward, pressing against the second molar.

Here is a specimen showing erosion, which is very distinct indeed. Undoubtedly this was the cause of the hypercementosis.

Hypercementosis does not always cause trouble. I have a case here of a tooth that I extracted February 25, in which I could not determine from the pain that there was any hypercementosis. As all the other teeth back of the first bicuspid were decayed down to the gum, I removed this tooth because I had to put in a plate, and I did not want to have it in the way.

I have here a specimen upon which the deposit was evidently caused by excessive function. On the first cast it may be noticed that every tooth except the one I extracted has an antagonist.

Some nine years ago a travelling quack came to Holyoke to extract teeth. He operated on the young man represented by this cast, who was then about seventeen years old. The lower left cuspid projected against the lip, was very hard to extract, and his jaw was injured. About three months after neuralgia set in, and remained constant from that time. Now, taking into account the injury from the extraction and that the tooth had no antagonist, I determined that this tooth had hypercementosis and removed it. The specimen shows the diagnosis was correct.

The tooth that is being passed around on Card No. 3 had an antagonist until a few years ago, when I removed the bicuspid above it. The man had had quite a nervous breakdown in the mean time, and after looking his mouth over, noticing that was the only tooth that did not have an antagonist, I determined that was the tooth which caused the trouble. Extraction showed it was the one. One thing I would like to speak of, and that is diagnosing by the bunch through the gum. I have never yet felt one, and in all the cases of trouble I have had there were not excessive deposits. I cannot describe the pain except as a pulp pain and one the patient cannot locate. To diagnose the trouble is something intuitive. When the patient describes the pain one seems to realize at once whether it comes from the pulp, for in none of these cases did I find any soreness on tapping the tooth. If a patient complains of pain in the ear, as a rule we can be sure that a tooth causes the pain. In all these cases but the first one the patients complained of earache.

Dr. S. E. Davenport.—I would like to ask Dr. Maxfield whether every tooth, so far as he can recollect, which has been proved in his experience to be in this condition, was without an antagonist.

Dr. Maxfield.—Whenever I have found this pain there has been no antagonist except in the first case, in which, as I have explained,

I was myself the cause of the hypercementosis. The lack of an antagonist is of much signification. In these cases more pain results than where the hypercementosis results from excessive function.

Dr. F. Milton Smith.—I would ask whether these teeth were loosened or firm.

Dr. Maxfield.—Very firm, indeed.

Dr. S. H. McNaughton.—Were the pulps alive or dead in most of these teeth, and were any of the living teeth treated by killing the pulp?

Dr. Maxfield.—Only in one case,—the first card I passed around. In all cases of pain resulting from hypercementosis treatment is of no avail. The tooth must be extracted.

The President.—Time does not permit us to continue the discussion of this subject. Dr. Ewing is with us to review the results of some recent investigations on the histology of dentine, and we will now ask him to do so.

Dr. James Ewing.—I have accepted the invitation to say a few words concerning a recent article relating to the minute structure of dentine. The article that I refer to is one by a German investigator—Morgenstern—which appeared in the *Archiv für Anatomie und physiologische Anatomie*, Abt., 1896, p. 326. It refers to an apparently successful effort to demonstrate the existence of non-medullated nerve-fibres in the dentinal tubule. This has been a mooted point for many years, but Morgenstern claims in this article that these structures have been successfully demonstrated by the use of a slight modification of Golgi's method invented by Ramón y Cajal. The conclusion reached is the result of a long series of experiments, extending over a period of six or eight years, which Morgenstern had undertaken in order to complete his demonstration.

The first point which I want to bring out is the method which he uses. He says it is a modification of Golgi's method, this modification consisting in the use of osmic and chromic acids as a fixing fluid. It is not necessary to go fully into the modification now, as it would require the description of a number of fluids, but it is enough to say that he proceeded as follows: He took the fresh dentine, chipping it off in small pieces, and in some cases sawing some masses from the main bulk of the tooth. These he placed in a solution of chromic and osmic acids, and after remaining in this solution for a week or ten days, the fluid being frequently renewed, they were removed and treated in alcohol, and finally by

silver salts, and at the end of three or four months the sections were ground down and examined. So much for the method which he uses.

The second point is what he found. He found that the differentiation of the structures in the dentinal tubules was very much clearer than he had secured by other methods. He recognized the dentinal fibres very much more distinctly, and in addition he found structures resembling the ordinary non-medullated nerve-fibres,—that is, they came out as black lines encircling the dental fibres and showing the characteristic nodal thickenings. In addition to these fibres, he mentions a point which seems to me of equal importance almost; that is, the presence of a set of nuclei in the dentinal tubules which apparently belong to endothelial cells. In these two points are the chief results of Morgenstern's work. He demonstrates the fine black lines with nodal thickenings which correspond exactly with non-medullated nerve-fibres, and he finds this separate set of nuclei, probably of endothelial cells. He goes into considerable detail in following the course of these fibres. They start at the bases of the dentinal tubules and run through the lateral anastomoses of these tubules. They run for the most part in the dentinal tubules, but also in the intertubular substance. Unfortunately the precipitation of metallic salt in most tissues is an uncertain method of demonstrating tissue structures, for the reason that there is not always a chemical union between the metallic salt and the structures, the salt precipitating sometimes in the spaces and sometimes in the structures. The question is whether these delicate lines which Morgenstern demonstrates are actual structures or whether they are spaces. The weight of evidence is certainly in favor of the belief that Morgenstern has demonstrated nerve-fibres, because where the salts have been deposited in the spaces, and not in the structures, the spaces have been very irregular in outline. The exact termination of these fibres he has not worked out, but he has demonstrated a very rich anastomosis between them; in fact, to a large extent, he has apparently solved the question of the nerve-supply of dentine. The presence of such nerve-fibre in dentinal tubules would, of course, explain the marked sensitiveness of dentine, which is a matter of common clinical observation.

It has appeared to me to be a very important fact, as stated, that he has found evidence to show that the fibres run in lymphatic spaces lined by endothelial cells.

I am reminded here of the specimens of Dr. Allan's, prepared

by Miller, showing the growth of bacteria in the dentinal tubules. On first seeing these I was astounded at the brilliancy of the demonstration. It is much easier to understand the deep penetration of these bacteria when it appears that the dentinal tubules are lined by endothelial cells, as bacteria readily penetrate lymphatic spaces.

The whole result of Morgenstern's work is certainly a just reward of a careful series of painstaking and honest studies in this interesting subject.

The President.—Will Dr. Ewing kindly inform us whether Morgenstern's paper has been translated into English?

Dr Ewing.—No, sir. It can be found at the Academy of Medicine, in the *Archiv für Anatomie und physiologische Anatomie*, 1896, page 326. There are two parts of that journal, and this is in the anatomical part.

The President then introduced Professor J. L. Wortman, of the American Museum of Natural History, who delivered an address upon "The Relationship of Dental Organs to the Doctrine of Evolution," illustrated by lantern slides.

This important paper will appear as soon as the illustrations can be prepared under Professor Wortman's direction.

The President.—It would seem that all philosophy has taken a step very much towards scientific demonstration, for as we look over the field we find that the religious men who are most thoroughly advanced in scientific studies, of whom there are a good many in England and some in this country, have gone quite as far in the acceptance of the doctrine of evolution as the professor has expressed himself this evening in his carefully chosen words and very moderate expressions. Indeed, a recent religious work of the highest type by George Matheson states that in no so dignified way could the creation of man be devised as by the one of evolution, which has been in recent years brought so prominently before us, and a careful examination of the best understood passages of Scripture that bear upon that subject and the comparison of them with the revelations of science show the fact that the two confirm each other most remarkably.

It is with much pleasure that we offer the thanks of the Institute to Professor Wortman for his very interesting discourse this evening, and hope that this is not the last time that we shall have the pleasure of seeing him among us.

Adjourned.

S. E. DAVENPORT, D.D.S., M.D.S.,
Editor The New York Institute of Stomatology.

ACADEMY OF STOMATOLOGY.

A REGULAR meeting of the Academy of Stomatology of Philadelphia was held at the rooms of the Academy, 1731 Chestnut Street, February 22, 1898, Dr. Edwin T. Darby in the chair.

A paper, entitled "Physical Conditions that determine Choice of Filling-Materials," was read by Dr. S. B. Luckie.

(For Dr. Luckie's paper, see page 503.)

DISCUSSION.

Dr. H. H. Burchard.—There are four elements, as I view it, to consider in the subject of Dr. Luckie's essay. The first of these is the filling-material. Filling-materials are, in reality, therapeutic agents, and they should be applied with a full regard to the chemical and physical properties of the agent; that is to say, their application is based on their physical and chemical properties. For instance, zinc phosphate has certain physical and chemical properties, which, when brought in contact with organic tissue, exhibits a certain reaction against this tissue, and so with gutta-percha, amalgam, etc., that is the first element to consider. An exhaustive knowledge of this is the *a priori* basis upon which the choice of filling-material in any given case depends. The second element is the question of the condition to which these agents are to be applied,—that is to say, the dental condition which we ought to treat with these therapeutic agents, that involves the condition of the tooth itself, what condition the tooth may be in, any amount of loss of tissue, the condition of remaining tissue, and so on.

The essayist took up what is an extremely important matter, and one, too, perhaps, to which not sufficient attention has been directed,—that is, the nervous reaction of the patient after operation, the question of shock. This is a matter which varies with the individual, and, as he has well said, it may be as much psychical as physical. However, the effects in both cases may be alike severe. Granting the skill of the operator, and given a clear understanding of the condition of the tooth, an exhaustive knowledge of therapeutic agents, and the ability of the patient to withstand any necessary operation, the question arises, With what material can he best accomplish a definite end,—that is, of course, the sealing of the cavity?

To discuss the subject exhaustively would mean the running over of all the literature of the plastic fillings and a general review

of dental pathology. But there is one point in his quotations from Dr. Black that I want to comment upon, and that is the question of density and the amount of calcium salts contained in the tooth. These are not necessarily associated with hardness of the tooth. The dentine may be hard or it may not, while exhibiting an unusual percentage of calcium salts, and it may be hard and not notably dense.

These factors are not necessarily related to one another; but if I begin with it, it means a review of Black's work, and that would be two weeks' work.

Dr. R. Huey.—Mr. President, this is a subject that is intensely interesting to all of us whose lives are devoted to the saving of teeth. I do not know that there is but one subject that I have ever thought more of in connection with operative dentistry, that interests me more than this we are talking about to-night. There is, I think, a line that should be drawn in regard to the use of plastic materials. I am very jealous for myself, for my time, and for my work, and I do not like to put my best work into mouths where there is a very decided probability that this may not last. I would draw my line at the condition of the mouth, and consider carefully the amount of fermentation, and the care which the patient bestows upon the teeth and their surroundings. I think that is really more important than the density or the calcification of tooth-structure. My experience has been that it does not recur just where it is supposed to recur. We are told that the weakest point is the cervix, and we expect decay to recur at that point. My experience has been that it usually takes place at either the labial or the lingual side of the cervix, unless the filling has extended out so far that the tooth will be thoroughly cleansed during mastication or brushing. It is almost impossible to get the patients to push silk back to the angle of the tooth and draw it forward, cleansing that point, which is to me the most dangerous. For that reason I do not like to put permanent work in a mouth where I am satisfied the patient will not take care of it. What I consider most is not the amount of calcification, but the education of the patient. In consequence of these facts I often carry a patient along as well as I can with plastics until the time comes when other work can be done.

Dr. H. C. Register.—The subject of the selection of filling-material is one resting mainly with the individual operator and with the individual case at the time of operating. I believe that there are a great many patients whose teeth would be lost if we under-

took to operate on them at one time with a material like gold, while, if it was postponed until the patient was in physical condition to meet the operation, success would be perfect. I have had several instances where the most trivial operations have been productive of quite serious results. I was once operating for my brother, and doing a very simple thing, when he fainted. I had hardly touched him, and yet it was because he apprehended being hurt. I have had several cases where patients, simply from fear, would almost faint. The idea suggested itself to me a few years ago to use some little attractions in my office to divert attention, and for that purpose I placed near the operating-chair a little aquarium. I even built a bird-box, and put it outside on the lattice for the sparrows of Philadelphia. I cannot but believe that success in filling teeth and the selection of materials to fill them depend very much upon the mental and physical condition of the patient.

Dr. F. Gardiner.—It is very difficult, indeed, to lay down a rule for every one to follow. Each man has to be governed by what he can do in a certain case; and in regard to filling proximal surfaces, particularly with gold, I think it largely depends upon the principle which is carried out. I should want very strong teeth, indeed, before deciding to fill a small cavity between bicusps and molars with gold, because it is very difficult to change the conditions. The same conditions remain after a tooth is filled that existed before, and that caused the tooth to decay. The probability is that decay will recur in a comparatively short time. In larger cavities, I think, we can venture to fill with gold very much more freely than we could in smaller cavities, and expect a permanent result. We have an opportunity of changing the conditions and of extending the cavity, so as to obtain self-cleansing surfaces, and to separate the tooth-substance absolutely from contact with an adjoining tooth. That of itself is a great hygienic measure. Each man should be the judge of what he can do himself rather than what others can do under like conditions, for more depends on that than upon the structure of the tooth.

Dr. James Truman.—The question that the essayist has introduced in regard to the effect produced on the mind as well as the body by operations seems to me one of vital importance. Some sixteen years ago I wrote for the Odontological Society an article on "Shock," which was received rather dubiously. In my opinion it is not only a physical depression to which our patients are liable, but also a psychical one, and that is probably as important as the

physical. The effect of shock upon the vasomotor system of nerves produces an anæmic condition. I have seen it so often and so markedly produced in the clinics of the institutions in which I have had the honor of being present, that I have come to regard it as somewhat alarming. I believe that few persons can sit as long as seven hours in the dental chair and not be brought into a depressed condition, tending to serious injury, and I hold, therefore, that any dentist so operating is legally liable. Two hours in the chair is all that is just to any patient, and not that without some study of the peculiarities of the individual. I am satisfied that a vast deal of harm is done in this direction, and that the essayist did well to call especial attention to it.

In regard to Dr. Black's idea of density, he holds that it is specific gravity, which we all understand to be density; but the dentist does not understand it that way. When a dentist begins operating on a tooth, he expects to decide the density of that particular tooth by his excavator, and if it cuts hard he feels that he can introduce a filling that will be satisfactory to both himself and his patient. If it presents that well-known soft appearance, he is aware that he cannot do that kind of work, and therefore must use something that has a therapeutic value, and wait until such time as the tooth becomes more dense. It seems to me that the ideas that have been promulgated in regard to this are wrong from a clinical stand-point. They have led many men to suppose that they could treat children's teeth—young women's teeth, along from fourteen to fifteen—with any kind of material; for Dr. Black has said that all teeth are sufficiently dense to be filled with metal. I am on record and hold to the opinion that children's teeth should not be filled with gold except under exceptional conditions. If we are to adopt theoretical ideas, such as Black and others have in regard to this matter, it seems to me that it will upset the experience of more than one generation of dentists. It has come down to the practical point that some teeth cannot be filled with metal. No matter how much we like it, or prefer to use gold or amalgam, or any of the other materials that we have, we must resort to the less resistant plastics for the purpose of saving these teeth, until the organic bases of the teeth increase their density.

Dr. O. E. Inglis.—I would like to put a little more emphasis on what Dr. Huey said in regard to the environments of the tooth. I think it is largely that upon which the choice of filling-material is dependent. I certainly, for my part, have quite a number of

patients in whom nervous prostration, indigestion, or other physical troubles have superinduced oral conditions favorable to caries.

In regard to the cleansing of the teeth, we all know that if teeth get into a habit of decay, they need thereafter very careful attention. The slightest projection or depression of filling-materials invites caries at the margins of the fillings. It becomes impossible at times to cleanse the mouth thoroughly. Under adverse circumstances we have to use the softer materials. Let us take, for example, the buccal surfaces of the third molars, and especially the buccal surfaces which are superficially decalcified over the entire surface. When a patient is nervous and bears operations very poorly, it is sometimes impossible to carry the margins of the cavity to a satisfactory completion. When that is the case, if gutta-percha and copper amalgam are used and renewed at reasonable intervals, these teeth are very frequently slow in decaying, especially if the health of the patient is restored.

Dr. C. E. Jeffries.—The subject of the selection of material for any given case is one of the most important in our calling. All of the list can be gone over to advantage in individual cases, even in the same tooth. The same material does not fit every case; we can use two, three, and sometimes four materials to advantage, instead of using one alone. Dr. Black has been quoted this evening as saying that he could put gold where he could put any metal to advantage in young or old. Now, he also says in some of his other writings that any kind of metal filling of any considerable size placed in a tooth will modify more or less the pulp and endanger its safety, if not in a few months or a year, then in ten years. It is very rarely the case that it does not; and it would seem to me that a man with such a general knowledge and thorough powers of investigation is making a very unwise statement to say that gold can be put in any tooth where metal can possibly be used. We know that gold is the best possible conductor, and therefore the worst material to put in a delicate tooth, regardless of age; but more particularly for young persons. I certainly cannot harmonize these statements coming from Dr. Black, and I do not understand his line of argument that in one case he would favor gold in all places where metal can be put, while he says in another that any metal fillings of any considerable size will modify the condition of the pulp, almost invariably to its disadvantage.

I think we cannot be too particular in the selection of our materials for filling, especially in the young. I use myself a great deal of gutta-percha, and I have the utmost satisfaction in its use for

young patients, as well as for some of the older ones. It is one of the most valuable materials that we have, and even if it does wear away, it is easily renewed. It is very seldom that we find evidence of decay about a gutta-percha filling, even when half worn away. Some of the cements do good service, while the much-abused amalgam is not used in the majority of cases in a way to bring about the best results from its use. Upon proximal surfaces it is quite the rule to leave the fillings unfinished, a condition which invites decay in the future; whereas, if they were finished as gold is, they would do better than gold. I do not think that will be disputed. So, to my mind, selection is a very important matter, and one of which the gold fiends are not sufficiently cognizant.

Dr. Louis Jack.—In nearly every instance when patients have come to me, excited over the approach of an operation, even if not threatening to be painful, I have found the use of aqua camphora of exceeding value, and several patients ask me for it—after having found the beneficial results obtained—before the operation is commenced. In some instances I am satisfied that the condition is induced by the momentary failure of respiration, and the aeration of the blood not being sufficiently sustained tends to increase the physical and nervous depression. You will observe in the consideration of the effects of the action of camphore tincture, or aqua camphora, that it tends to lessen nervous perturbation. The manner in which I use it is to allow the patient to gargle and rinse the mouth, and in marked cases I allow them to take about a drachm internally.

Dr. O. E. Inglis.—The use of chloral hydrate, under such circumstances, works nicely; five grains administered to the patient before the operation rather calms the nervous system and brings about a condition which enables one to operate very well.

Dr. Wm. Trueman.—The paper to which we have listened tonight is one of those of which I wish we could have more; it is carefully and thoughtfully written and thoroughly practical from beginning to end. As the doctor suggests, in the case referred to, the gold filling comes back to us and we find discoloration about the edges and considerable organic matter which must be removed.

We all recognize that there are some classes of teeth that we must treat very gently; the softest fillings probably preserve them best. I know what it is to sit in a dentist's chair from eight o'clock in the morning to five in the afternoon. I know what it is to spend ninety-six hours in the chair in a week. And what was the result? Dr. Webb did as well for my teeth as any man could do, but in

about three years one of the four teeth which I had filled broke down; in about seven years more another followed. Dr. Webb seemed to think that a solid gold filling would improve frail tooth-structure. It proved otherwise. In the case of many gold fillings put in with all possible care, after a lapse of a dozen years (perhaps not so long) there is a wearing down of the tooth-tissue, and the gold, not wearing so fast, breaks away. I think that while rules for our guidance may be laid down, all these must at times be laid aside and our own practical experience be made the judge.

Dr. R. Huey.—I believe all of us agree that the teeth ought to be well calcified before a gold filling is inserted. I want the gentlemen either to condemn the practice or to confess that there are times when they feel that a gold filling ought to be inserted before this calcification has taken place. I have one pet habit of inserting a gold filling upon the mesial surface of a first molar before the second bicuspid comes in. I like very much to get a gold filling in this situation, because I can do it more thoroughly and easily and in a shorter time, yet sometimes my conscience pricks me if I have recurrence of decay at this point for having made that operation. In a great many cases the operation has partially succeeded better than if I had wedged the teeth apart and filled it. I would like to hear what some of these gentlemen think of this practice and whether they follow it.

Dr. J. A. Woodward.—That also is a weakness of mine. I prefer to fill the mesial surface when the temporary molar is lost and before the second bicuspid comes into place, but I sacrifice the enamel and dentine until the edges of the filling will be free from contact except at the point where the teeth touch. With these fillings I have been very successful.

Dr. Luckie quoted from Dr. Black that the density of the dentine has very little to do with determining whether the tooth shall be filled with metal or not. Some years ago it was my fortune to be associated with a very skilful operator who would fill the first molars on the proximal surface with gold even when he had to push the gum back with a ball of cotton. Those fillings have always done well. I do not know that I have seen any recurrence of decay about such fillings. This fact led me to doubt whether the density of the tooth had much to do with the durability of metal fillings. I think there is more in the manner in which a tooth is filled.

I use gutta-percha largely on the occlusal surfaces of the molars and bicuspid of children, but as soon as possible I change to gold, without regard to age, and I do not think the surroundings

have much to do with it. I think that gold well introduced, if not broken up or marred by mallets or improper instruments, makes as good a filling as any other material. It is better than amalgam, and such fillings, when properly introduced, have resulted satisfactorily.

With reference to decay about proximal fillings, I find that oftentimes it will start at a distance from my filling, and if the examination be closely made, a sound portion of enamel will be found between the filling and the new centre of caries. We may thus blame ourselves for making defective fillings while really decay has occurred at another spot.

Dr. C. E. Jeffries.—I should like to know if those gold fillings were not entirely of non-cohesive gold and placed in with smooth points.

Dr. Woodward.—They were of cohesive gold and placed in with serrated points.

Dr. James Truman.—The idea of placing fillings of gold against the soft structure of certain teeth seems to me altogether erroneous. I cannot understand how such fillings can be successful. In my experience the conductivity of the gold permits thermal changes to eventually produce congestion and death of the pulp.

I should fill the mesial surfaces of the first molar with tin-foil and wait until that increase of density, of which Dr. Black speaks as coming in the course of years, takes place. If used upon the cohesive principle, tin, which is a very poor conductor of heat and cold, is the best metal for use where gold is contraindicated. I do not think metal is always required. For twelve years I worked in the Institution for the Blind in this city and used nothing but tin, rarely placing in a gold filling, and many of these teeth are well preserved to-day. That is a very good test when we consider that the patients were children. We do not appreciate tin sufficiently.

Dr. Woodward.—What I said was based on experience. Theoretically I know there is much objection to gold in young teeth. Large cavities are not usually found in young teeth, consequently you can fill them with gold.

Speaking of Dr. Huey's anterior surfaces of the molars, I would not want tin there, but gold, something that would retain its contour.

Dr. Louis Jack.—I have been filling first molars with gold, but would not do so if the cavity was deep. If I did I would line the bottom of the cavity with a non-conductor.

Dr. O. E. Inglis.—I can see no reason why a cavity on the mesial surface of a first molar cannot be filled with gold. If the fillings are contoured, as Dr. Woodward states, with self-cleansing surfaces upon the buccal and lingual side, the only recurrence of decay would be at the cervical margins. If caries does recur, it can be repaired with amalgam, gutta-percha, or tin. As far as the masticating surfaces are concerned, I think it is a common observation that well placed fillings which are resistant of mechanical and chemical forces will last. If gold is used, they will probably last as well as when made with anything else, perhaps better.

Dr. R. Huey.—Just another factor. Admitting that we can make a lasting filling with gold in the young tooth, is it fair to the young patient or to the dentist? I find in my practice that a young child always has a certain nervous dread, and if I fill that child's tooth with gold it will have a horror of dentistry for which I am to blame, but if I carry that child along with plastics until the thirteenth or fourteenth year it has no dread of dentistry. I have not hurt that child unnecessarily and I have saved the tooth.

We very frequently have cavities in this situation that are not more than a thirty-second of an inch in diameter,—after everything is removed. If the child is in the hands of a careful dentist, it is very rarely that these cavities reach any size. Some one is to blame if they do. We often find a very slight infection of the enamel on that surface. The question is, Should we fill or let it alone?

Dr. Woodward.—In that case I should polish it out without destroying its contour. If I could not do that, and it was slight, I would let it alone.

Dr. R. Huey.—How about the cavity in the second bicuspid later?

Dr. Woodward.—I would take care of that.

Dr. S. B. Luckie.—I do not know that there is much that I can add. The subject is not yet exhausted. The intent of the paper was to show that the basis of selection lies in the physical condition of the patient and also the physical condition of the tooth; and at the same time, I did not ignore other conditions that I considered of secondary importance, as, for instance, the hygienic conditions of the mouth. Another object of the paper was to provoke a discussion upon Dr. Black's conclusions. On that point I am somewhat disappointed. There are times when the physical condition of the patient indicates a gold filling or other prolonged operation, and yet the condition of the tooth counteracts it, and *vice versa*. A lady for

whom I operated carefully for eighteen years, never exhibited the least sign of exhaustion, though being in the chair many times as long as two hours at a time, until this winter, when two teeth that had been filled with plastics were required to be refilled. She made the appointment and I reserved an hour and a half to fill them. I had the teeth filled in a little less than that time. I noticed she was somewhat fatigued when getting out of the chair. She had to go home and go to bed, she was so exhausted. That was a case where the physical condition of the teeth demonstrated that they could be filled with gold and yet the physical condition of the patient was not favorable to it. To-day I finished a lady's mouth who nearly always has had her teeth filled with gold. Two years ago she came to me after having typhoid fever, and for the first time I told her that I would not fill her teeth with gold but with amalgam. I told her that her teeth required more filling than at any time during the period I had her under my care,—probably fifteen years,—and yet a number of fillings showed a degeneration of the structure of the teeth around the fillings. I can take the edge of an excavator and chip the tooth away from the filling, a number being in that condition. I refilled a number of them, requiring large fillings; all were gold except one, the lower third molar. There are times when gold should not be used, when we should return to plastics, and expect nature to assist us in getting them into condition for permanent work, and yet young children's teeth are often in such a condition that gold can be used quite as well as in the teeth of older people.

The matter of filling the first permanent molar, as suggested by Dr. Huey, depends very largely upon the judgment of the operator and his ability to manage the patient at the time. I am very much averse to filling the teeth of children with gold; I prefer to treat them as gently as possible and make it as easy for them to return, when necessary, as I can.

OTTO E. INGLIS,
Editor Academy of Stomatology.

Editorial.

DR. BLACK'S REVIEW.

IN the June number of the *Dental Cosmos* Dr. Black reviews his reviewers as they appeared in the December, 1897, number of the *INTERNATIONAL DENTAL JOURNAL*. That this will be regarded as a satisfactory reply seems doubtful, for his words, while respectfully phrased, have a sarcastic flavor little in keeping with scientific writing, and not at all favorable to the establishment of a scientific basis worthy the acceptance of the entire dental profession.

Dr. Black was fully aware that his deductions from his experiments would arouse antagonism everywhere, for these were in direct opposition to the clinical experience in dentistry for many decades. It was therefore proper that men of large experience should give their views, and that these should be carefully considered.

It is not by any means the first time that laboratory and clinical experience have come into direct antagonism. It is possible that both may be right, and it is therefore unsafe for either side to assume too much. The former demands that all experience shall bow to its dictum, and that no truth is possible except it be demonstrated by actual experiment. That this is an untenable position needs no argument. It is impossible to spare either method, and he who attempts it will find himself very speedily in a maze of difficulties.

Dr. Black pays special attention to the essay of the editor of this journal, and says, "Dr. Truman thinks I may have reported truly on the teeth in hand, but that the right teeth were not obtained, for, he says, page 797, 'If, on the other hand, teeth had been selected from a mouth recognized as having chalky teeth, and these be compared with the aforementioned, and the result had been the same, it would not have been possible to have offered any criticisms, for even personal observations must give way to the crucible of analysis.'

"No other person, to my knowledge, has resorted to such an argument as this. It amounts to a simple denial that I did the thing that I took especial pains to do and so expressed. . . . On page 358, *Dental Cosmos*, May, 1895, under the head of 'Collection of

Material,' it will be found that capable dentists who assisted me, and who are named on page 366, were instructed to give the 'nativity, age, state of the general health, to *class the teeth as bad, fair, or good; as to occurrence and rapidity of caries*, record the condition of gums, etc.,' thus fulfilling to the letter the requirements Dr. Truman would impose and which he sees fit to ignore."

This does not meet the question and is an unfair statement of facts, for Dr. Truman has invariably quoted this paragraph in the several articles prepared by him upon this subject. The construction which he places upon this differs from that of Dr. Black. It is assumed by him that this is the weak point in Dr. Black's experiments, and had this link in the chain been perfect there would have been no cause for criticism as to methods. It is repeated, therefore, that this plan of collecting material was a weak starting-point. *The teeth that the dental profession calls soft and chalky are not to be had for the asking, and it must be exceedingly rare that they come into the dentist's hand through extraction*, as they are mainly to be found from the ages of twelve to twenty. This it is thought will be universally conceded. Dr. Black cannot expect that intelligent practitioners will accept the teeth sent to him as representing their idea of soft, chalky teeth. The arrangement as outlined by him was doubtless the best he could do, but to base a complicated series of experiments upon a collection thus made seems to Dr. Truman to be placing in jeopardy a scientific reputation worthily earned and universally honored.

Dr. Truman is again taken to task for inconsistency, for Dr. Black says, "Dr. Truman denies his own statement, seemingly, when he says, page 798, 'Caries is not confined to teeth of poor structure; indeed, it may be said, with some degree of truth, that this is no indication of the character or even the extent of the destruction.' I submit the doctor should guard his statements better than this." Exactly what Dr. Black sees in this sentence inconsistent with anything previously stated will remain a mystery to Dr. Truman. The dentist who does not know that all teeth, given the "opportunity," as Dr. Black states it, will decay, must have lost the faculty of observation, if it ever existed. That all teeth are liable to decay is an axiomatic phrase, but the capability of distinguishing the conditions that existed prior to caries from examinations out of the mouth is an unknown quantity.

Further, he states that "Dr. Truman then runs off in a wild chase after *leptothrix buccalis* in an effort to controvert jointly Dr. Williams's paper and my own." Exactly what is meant by a "wild

chase" is not apparent. It may mean, in Dr. Black's estimation, a chase after something non-existing. The point will not be contested. If, however, he means to convey the idea that Dr. Truman does not know much of the subject, he may be kindly informed that that individual has devoted many years of his life to histological work, and deems himself quite capable of at least forming an intelligent opinion upon any subject relating thereto. The question cannot be dismissed by a wave of the hand, the dash of a pen, or sarcastic allusions, but must be met. Unfortunately for Dr. Black, and indirectly for Dr. Williams, the following admission of the former concedes all that Dr. Truman claimed: "They [leptothrix] have therefore long ago been dropped out of consideration as caries-producing fungi. It is fungi of a different sort that are the active agent in the production of caries." Dr. Truman's contention could not have been expressed more plainly. Dr. Williams's original pictures and his slides, since seen by the writer, demonstrated that the "gelatinous microbial plaques," as Dr. Black calls them, were plentifully distributed, and that they were leptothrix threads *and not the micro-organisms of caries*, hence not acid-producing. Dr. Black having acknowledged this, and Dr. Williams, in his apple story, brought to bear on Dr. Truman, having equally acknowledged that the evidence was altogether circumstantial, the entire question may be left where it properly belongs,—to future examination.

Dr. Black further says, "When Dr. Williams showed the presence of these organisms in the gelatinous microbial plaques upon the teeth, together with the effects upon the enamel beneath, it was not incumbent upon him or any one else to prove again that these were acid-producing organizations, and that they furnished the acid which caused the chemical disintegration which was apparent." This might be all true provided Dr. Williams did show the acid-producing organisms, but Dr. Truman failed to discover these in any appreciable numbers, but did find leptothrix buccalis profusely developed, and these threads, he may repeat, have not been identified as acid-producers.

If there is any statement in this review of Dr. Black more worthy of astonishment than another it is this: "It seems to me too late for any one to argue that caries of the teeth is caused by acids freely dissolved in the saliva." The school of Dr. Black and Dr. Williams, in which Dr. Truman holds much in common, has declared over and over again that environments, and not density, have much to do with the production of caries, or, to place it more correctly, the acid conditions generated in the oral secretions act

chemically upon the teeth and invite the formation of caries-producing organisms. It is possible that Dr. Truman fails to understand Dr. Black, but, as comprehended, the statement is inconsistent with much heretofore given, as it is equally untrue in fact.

There is no desire to extend this controversy further, but it is imagined the dental profession will not be converted to Dr. Black's deductions, or to Dr. Williams's peculiar polemical methods, as long as they confine their work to the laboratory and hold as practically valueless all clinical observations. From these leaders in laboratory work we have a right to demand facts and not thoughts. Deductions properly made must always have a value, but a story of an apple thief in Dr. Truman's apocryphal garden may be amusing and entertaining to professional groundlings, but can have no value as a means of advancement of our knowledge in the science of our profession.

A REPLY FROM THE NEW JERSEY SECRETARY.

UPON another page is presented to our readers a rejoinder to our article (May, 1898). The reply speaks for itself and does not require an answer upon our part. If the State of New Jersey and its examining board are satisfied with its representative, the "Secretary, Dental Commission," this journal has no cause for complaint, but it is to be regretted that some one was not found willing to meet the issue made, and who would be qualified to present the subject with the dignity worthy the State and the profession.

The quotations made from various speakers in 1892 may or may not truly represent their opinions at the present time. The gradual encroachments upon the rights of colleges, by State boards and the National Association of Examiners during the past six years, have led many of the teachers in colleges to revise their opinions, and, doubtless, the gentlemen quoted may have something to say upon the subject at the proper time, in fact, one (Dr. Peirce, *INTERNATIONAL DENTAL JOURNAL*, April, 1898) has already given his views, which our correspondent failed to find suitable for his purpose.

The attempt, by implication, to bring Dr. Jack into the circle of defenders of the right to practise irrespective of collegiate training is a violation of the rights belonging to every individual, and will add nothing to the reputation of our correspondent. In justice to Dr. Jack, the following quotations from his paper, read

at the meeting alluded to, are given, and they are recommended for the careful reading of the New Jersey State Board.

"The presence of the principle, however, that any person may come forward and submit to an examination has had a demoralizing effect upon many who, without this opportunity, would have had no other course open than either to undergo a college preparation or abandon the attempt. . . . My views upon the next to impossibility of any person of the class indicated making a creditable examination have been long entertained, and have become strengthened by my experience on the examining board of the State. When we come to another class of persons, those who have attended two years of school training, who may be offering themselves ere long in the States which are required to examine any who may present for certificates, the discussion assumes a still more serious aspect.

"The expression of opinions by leading dentists, that the curriculum of the dental schools required enlargement, and the period of study extension, with the concurrent action of the schools and the Association of Dental Faculties to the same effect, resulted in improved courses of study in some of the schools, and the enforcement by the Association of Faculties upon their associates of the three years' term of instruction. . . . The danger of this action being weakened by the obligation of the examining boards in so many States to make examination of any undergraduate who may present for this test makes the question now before us an extremely important one. It is readily perceived that it will tend to weaken the cause of dental education, and is a menace to the three years' course of instruction.

"Examining boards may have an understood policy, which may render it difficult for any one to pass their ordeal, but it appears there can be no safety for the schools of the dental profession until the laws are modified to make it impossible to get a certificate of qualification from a board of examiners alone."

The general tone of the communication from the secretary makes further comment unnecessary. Its tendency will be to still further lower the estimation placed upon the law of New Jersey by a very large number, and will prove, more than any words of ours, that the future well-being of the dental profession does not lie in the direction of boards of examiners governed by laws similar to that recently enacted in that State, nor will the profession be ennobled by the degrading tendencies which it represents.

A MOVE IN THE WRONG DIRECTION.

AN effort is being made to change the place of meeting of the National Association of Dental Faculties and to meet independently of the National Dental Association. The arguments brought forward to sustain this are that three-fourths of the delegates are from points east of the Mississippi, and that a large number of delegates are not active members of the National and feel very little interest in it. That it would be better to go to Chicago, Indianapolis, Cincinnati, or Louisville.

This effort to separate the place of meeting has been made almost yearly, and has, with one exception, invariably failed. A large proportion of the members of the Faculties are active members of the National Association as at present organized, and feel a deep interest in it. To stop half-way to attend the Association of Faculties and then proceed would be to many an annoyance of such magnitude that it is presumed few would think of attempting the additional journey. To deprive the national organization of the services of these men simply means a reduction of a large portion of its vitality. It must be remembered that Boston, New York, and Baltimore furnish one-fifth of the delegates, who have the longest journeys to make, yet it is assumed that their preference would be to meet where they could enjoy the larger social life which is the result of a combination of associations.

The experiment of separation was tried at Chicago some years ago, and resulted in a very unsatisfactory meeting of the Faculties, owing to the anxiety of the members to hurry the business and start for the meeting of the American Dental Association.

There is no urgent reason for a change from former years, and if put to a vote it should be negatived.

Bibliography.

A TEXT-BOOK OF DENTAL PATHOLOGY AND THERAPEUTICS, INCLUDING PHARMACOLOGY. Being a Treatise on the Principles and Practice of Dental Medicine. For Students and Practitioners. By Henry H. Burchard, M.D., D.D.S. Special lecturer on Dental Pathology and Therapeutics in the Philadelphia Dental College. Illustrated with three hundred and eighty-eight engravings and two colored plates. Philadelphia and New York: Lea, Brothers & Co., 1898.

The past two years has been a prolific period in new dental books, and the present volume, by Dr. Burchard, is a fitting conclusion of his labors on the two preceding books issued by Lea, Brothers & Co.; certainly an extraordinary production from a single house in one line of work.

To the average writer the labor performed by the author upon the previous volumes, as one of the collaborators in each, would seem to have been sufficient for the time being; but this volume of five hundred and eighty-seven pages, including index, is a full attestation to his energy and comprehensiveness of thought in his chosen work.

The author says in his preface, "This volume is designed as a text-book of the principles and practice of dental medicine for the use of students, and as a reference work on applied special pathology and therapeutics for the use of dentists."

The book opens with a chapter on "General Principles," which, it is needless to say, is ably, though somewhat briefly handled by the author. The succeeding two chapters on "Causes of Disease, General and Local Bacteriology, with Special Reference to Dental Pathology and Therapeutics," cover much valuable matter, and are treated with the attention and care due these important subjects.

The fourth chapter, on "Disturbances of Nutrition: Atrophy, Degeneration, Necrosis, Hypertrophy, Tumors," may be regarded as a too limited treatment of those extensive subjects; but it must be remembered in examining a book largely intended for students that brevity is essential. It is doubtful, however, whether the author's subdivision of necrosis is sufficiently full for that very class. This appears to be the only allusion made to this important

pathological condition, and is unsatisfactory, for beyond the general principles governing its etiology and progress, nothing is given. 'It is probable that the author considered this as properly belonging to oral surgery, and hence not appropriate to a work on dental pathology. This is true in part only; in fact, surgery has but a limited part in its treatment. The dental practitioner of the present period must accept all cases of this character, and in his care they should be kept until the time arrives for the surgeon to perform his part. It would seem, therefore, a mistake not to have embodied in this work detailed methods of diagnosis, positive and differential, and treatment during the waiting period, antedating the formation of the sequestrum.

The next chapter, on "Disturbances of the Vascular System," covers, in part, inflammation.

This is treated with the author's usual clearness of expression, but does not, in the view of the writer, meet the demand of those familiar with the steps taken to reach the present intelligent conception of the subject. It would not have added materially to the size of the volume to have made the readers acquainted with the work of Döllinger (1819), Müller (1824), Kaltenbrunner (1826), and Waller; Addison and Williams's work, in England, from 1846 to 1849; also von Recklinghausen, and Beale, upon the character of the white blood-corpuscle, investigations which changed entirely the previous conceptions entertained in regard to this element in the blood, and prepared the minds of investigators for the Waller-Cohnheim theory of inflammation. More allusion, it would seem, should have been made to the older proliferation theory of Virchow and to the work of Stricker and his school in connection with it. The work of Waller, of England, antedating by many years that of Cohnheim, should never be allowed to sink into oblivion and be forgotten in the discussion of the several changes following irritation.

The chapters from I. to VIII., covering one hundred and seventy-nine pages, are, as a whole, worthy of special commendation. They are thoroughly illustrated with the care taken by the author in previous works.

The chapter on dentition is generally satisfactory, but the author's statement that "perhaps the most common cause of failure of root-resorption of the temporary teeth is to be found in septic conditions of their roots," cannot be accepted. While it is true that this condition does interfere with resorption, it is equally true that the permanent teeth are so frequently erupted independently of the *living* deciduous, and that without resorption having taken

place in the latter, septic conditions cannot be regarded as an important factor in non-resorption.

The statement that "it is rare that abnormalities are associated with the progress of the first or second permanent molars," requires modification. While true of the first, on account of ample room in the jaw, it is not true of the second molars. These teeth, developed as they are, in the inferior maxillæ, in the rami of the jaw, are necessarily subjected to much of the difficulty of eruption experienced by the third molars. In the attempt to assume the direct vertical position in the jaw, the second molar occupies a very narrow position at the angle, with the liability of impingement upon the inferior dental nerve. This is liable to occur about the eighth or ninth year, resulting in severe nervous disturbances, frequently of an alarming character. This is not generally recognized as it should be. The reviewer has frequently aborted convulsions at this age by a careful watching of symptoms, coupled with deep lancing.

Some criticism seems necessary in regard to the treatment of the pathological conditions following the eruption of the third molars, more particularly in the inferior maxillæ. The author states that "should the mesial half of the crown be free and the posterior half covered by a curtain of gum," it is advised that "the pocket between the tooth and gum be eradicated." This is well, and the subsequent treatment is in agreement with prescribed rules; but the author fails to recognize that the cause of retardation of the third molar, otherwise normally erupting, lies not in the overlapping flap of gum, but that it is obstructed in its advance by the superior third molar. This is the explanation in the majority of cases. Where both of these teeth, superior and inferior, have been erupted synchronously, there should be no irritation, as the jaw is developed *pari passu*. Yet it may occur by pressure of the superior third molar upon the gum. The treatment here is not through sedatives or antiseptics, although both are valuable, but in an intelligent attention to the cause of the inflammation, the malposition of the teeth, which must be corrected either by extraction or excising a portion of the occlusal surface of the enamel upon one or both of the offending teeth.

In the chapter on "Malformations and Malpositions of the Teeth," it is to be regretted that the author fails to give a satisfactory method of diagnosing an impacted third molar, resting horizontally in the jaw and necessarily invisible. It is clearly evident that the third molar, entering the inferior maxilla from the ramus,

is liable to this position; and it is further in evidence that if it meets with no obstruction, it will continue its progress forward, and, ordinarily, will not be a cause of reflex disturbance. If, however, *all the teeth* anterior to and including the second molar, are in place, the tooth must stop with impingement upon the roots of the second molar. This means pressure posteriorly upon the inferior dental nerve, and protracted suffering to the patient. It would seem, therefore, a simple thing to state that if *all the teeth* are in place upon that side with the exception of the third molar, with reflex pain present, the cause must be an impacted third molar situated as described. It then becomes a simple matter to find it with the explorer. This is such a serious lesion that it would have been more satisfactory to have had the entire subject fully explained.

It is impossible to agree with the author that "there is no evidence that green deposits stand in causative relation to enamel decalcification." While it is true that green stain upon mature teeth has but a moderate effect upon enamel, it does produce serious destruction upon young teeth. While the author is in accord, in making this statement, with some of the highest authorities, it is not in harmony with the reviewer's experience.

The chapter on "Dental Caries" naturally attracts the dental reader, and he will not be disappointed as to the careful *résumé* of the whole subject. The author devotes space to the more recent investigation of Miller, but fails to do justice in his "History" to the steps that led up to Miller's work. The reviewer would suggest that, in a future second edition, this chapter should be carefully revised. No mention is made of Bell, the advocate of the pure vital theory of dental caries, or of Erdl, the originator of the germ theory, or of Lieinus, who has the credit of this, or of Klencke, who, in part, supported it. The work of Leber and Rottenstein is alluded to more briefly than seems to be warranted by its value. The modern idea of bacterial invasion in caries really dates from the work of these distinguished observers, and found its final culmination in that of Miller.

The following quotation indicates that the author is a full adherent to the dictum of Black, that "the hardness or softness of teeth, the amount of calcium salts they contain, or even their anatomical alterations, cannot, as shown by Black, prevent the advent or progress of dental caries, although they undoubtedly do modify its character and rate of progress." If it "cannot prevent" progress, what becomes of the so-called eburnated dentine in which

caries has ceased altogether? That the "hardness" of teeth does determine the rate of progress of decay is a well-settled fact in clinical practice, and it is a waste of time and trying to the patience of practitioners to attempt to deny the evidence of experience.

The definition of abrasion, as given, does not meet the conditions that result in the wearing down of teeth. It is ascribed to "the friction of mastication when gritty substances are present." It should be a recognized fact, but unfortunately it is not, that acids play a prominent part in this reduction of the occlusal surfaces of teeth. This has been fully demonstrated, and combined with attrition, with or without gritty materials, there will be a continued loss of substance. The author overlooked the reviewer's work in this direction, in which he demonstrated the acid reaction of the oral fluids in all conditions of rest, and this being especially true at night, when the alkaline salivary secretions are reduced to a minimum. This is not only a prolific cause of the earlier destruction in caries, but also a direct producer of erosion as well as abrasion. Prior to these investigations this fact had not received attention. Kirk subsequently demonstrated the acid action of the mucous follicles of the lip as being an additional factor in the destruction.

The treatment of "Hypersensitivity of Dentine" will generally be regarded as meeting all conditions, but it is not exactly true that "ever since a belief in the chemical nature of dental caries has been accepted, writers upon dental pathology have ascribed the hypersensitivity of dentine in caries to be due to the action of an acid, and have advised the use of alkalies to lessen the sensibility." While the reviewer does not desire to claim special credit, it is due to the history of the subject to say that, up to the time he recommended sodium bicarbonate to lessen sensitivity, there were no agents openly advocated for this purpose except the escharotics, zinc chloride, carbolic acid, and even arsenous oxide.

It is a gratification to find that the author explains the serious objection to the use of caustic alkalies. The extended use of these in the so-called "Robinson remedy" has become a dangerous method of practice, and the practitioners who make use of these and similar protoplasmic devitalizers should take the author's words seriously into consideration.

The reviewer fails to find under "Inflammation of the Dental Pulp, or Pulpitis," any allusion to a recognized condition known and described by writers as superficial pulpitis. This is understood to be an increased vital action in the superficial cells of the pulp caused by continued or slight irritation. In character, but

not in extent, it resembles the hypertrophy of the pulp known as fungoid pulp, but must be differentiated from this. The author fails to describe it properly under "Chronic Degenerations of the Pulp." Attention is called to a typographical error in the omission of the umlaut in Arkövy. This is correct in the illustration, but not in the text.

The author writes, "Iodoform, also used as an analgesic ingredient in some prescriptions, is of doubtful value." This is quoted from "Effect of Arsenic on the Pulp." This statement would occasion more surprise were it not for the fact that this is a view generally held. That it is a very mistaken conception of the value of this drug hardly needs assertion, for it is a well-recognized fact that there is no agent in the entire pharmacopœia that possesses the anæsthetic property to a greater degree. In this respect it equals chloroform, with the advantage over this in not being dangerous and retaining a permanent analgesic effect upon the tissue. When properly used in connection with arsenic for devitalization of pulps, it is effectual in reducing the pain and rendering it possible to make an immediate application to an irritated pulp. It must, however, be used properly, and not in the shape of a formula ready prepared.

It is rather surprising that no mention is made of the amount of arsenic to be used upon the pulp of a single-rooted tooth. No warning is given the student of certain possibilities that may happen by the use of an excess of arsenic. The application of this dangerous agent in this way is unscientific, and equally so is the recommendation of "devitalizing fibre." This has no business in the hands of any careful operator, and should long ago have been excluded from practice.

The author quotes Miller with crediting Witzel with the first systematic observations in making the pulp permanently aseptic. He says, "Witzel, in 1874, devitalized the crown portion of the pulp by means of arsenic, extirpated that portion, leaving the pulp in the canals undisturbed, their exposed ends being treated as freshly exposed pulps." It is true that Witzel made this statement, but twelve years later, 1886, he speaks of the shrinking of the pulps in most cases to antiseptic threads. He also, in the mean time, had changed his capping material. The reviewer always understood that Witzel had in view non-infected pulps, or what is generally known as superficial pulpitis. Dr. Allport, of Chicago, years before Witzel, advocated a somewhat similar method of amputation of the pulp.

It is impossible to coincide with the treatment given for pericementitis, for while the reviewer recognizes the absolute necessity of treating the cause, and in this respect is in full accord with the author, it remains true that the methods advised will tend to produce serious complications. It is difficult to understand the author's treatment of alveolar abscess, which follows in natural order. He objects to "hot applications and the use of counter-irritants upon the gum," and prefers "bloodletting by means of a leech." The latter has no place among the counter-irritating agents of the careful operator, for it is not only disgusting but involves the danger of blood-infection.

The chapter on "Pericemental Diseases" includes "Salivary Calculus," which is an excellent presentation of the subject and very perfectly illustrated. This is followed by a dissertation on "Pyorrhœa Alveolaris," with which, it is needless to say, the reviewer does not agree. Considerable space is given to gouty pericementitis, which yet remains to be proved as an existent pathological condition.

The remaining three chapters are on "Diseases of the Deciduous Teeth and their Treatment, Reflex Disorders of Dental Origin, and Infections of and from the Mouth and Sterilization."

Section VII. is upon "Dental Pharmacology and *Materia Medica*." This will no doubt prove a valuable addition as a matter of convenience to the student for reference.

The reviewer has not thought it necessary to call special attention to the value of each chapter or subchapter, as these exhibit, page by page, the great care taken by the author to condense not only his varied experience, but that of others, in a form best adapted for the needs of the student and active practitioner. It has been deemed the most fitting for one engaged in the same line of teaching to select here and there differences of opinion and practice and to give our readers a glimpse of the leading thought in the volume. This has not been done in the spirit of hypercriticism, but to indicate prominent points in the work and to demonstrate wherein he disagrees with the author, not in a captious spirit, but with a desire, common to all conscientious workers, to reach a common standard of practice. The fact that there exists a wide difference of opinion between the author and reviewer constitutes no objection to the book, for men must differ, and age and experience are no infallible tests and may often take wrong paths. Experience has, however, one merit in that it results in positive opinions, and while the avoidance of dogmatism may be a virtue, its opposite, a too free

yielding to a variety of theories, has a tendency to produce confusion in the untrained mind.

Notwithstanding all that has been written by the reviewer, he still regards this work of Dr. Burchard's as the most valuable and practical that has yet appeared upon dental pathology.

Attention has been called to a few things that seem to need modification and correction, but these can all be attended to in the second edition, sure to come in the near future. The book, as it stands, will be accepted, without doubt, by all colleges of dentistry in the United States, for the teachers in this branch have waited impatiently for a text-book to recommend to their several classes. That it will eventually become the standard work on dental pathology and therapeutics can scarcely be questioned, as it is free from much of the objectionable features common to books prepared by a single individual.

The publishers are entitled and should receive the thanks of the entire dental profession for the manner in which this work has been issued, and all those that have preceded it. The efforts they have made to give to dentistry satisfactory works on the various branches taught should be met by a corresponding effort on the part of teachers to increase the circulation among students.

Obituary.

RESOLUTIONS OF RESPECT TO DR. ALONZO BOICE.

At a stated meeting of the Odontological Society of Pennsylvania, held March 12, 1898, the following resolutions concerning the death of Dr. Alonzo Boice were read and adopted:

"WHEREAS, In the death of Dr. Alonzo Boice this Society has lost a public-spirited, generous, and devoted member;

"Resolved, That the members of the Odontological Society of Pennsylvania, of which the deceased was an active member, do hereby express the sense of their loss suffered in the death of Dr. Boice, and of their appreciation of his services to this Society and to the dental profession; and be it further

"Resolved, That these resolutions be incorporated and published in the proceedings of this Society, and a copy of the same be forwarded to his family.

"I. N. BROOMELL,

"GEO. W. WARREN."

Domestic Correspondence.

REPLY TO EDITORIAL, MAY, 1898.

TO THE EDITOR:

SIR,—Owing to your long-standing and outspoken antagonism to dental examining boards, and all protective legislation of whatever kind, your editorial in the May issue of your journal was not a surprise, as you always have at least been consistent in maintaining that all the knowledge contained in the dental profession was centred in the heads of the professors of the dental colleges, and of course more particularly those holding chairs in a certain institution.

That there could possibly exist men in the mere every-day walk of the profession who could know enough to examine the graduates of a college has been denied by you time and again, so the animus of your article is too apparent to need much attention. You demand the repeal of the obnoxious law, and say that, "It is deeply to be regretted that the dentists of New Jersey have had this scandalous piece of work thrust upon them, for we are willing to believe that all are not responsible. As it stands at present, New Jersey has put back dental education in that State to where it was prior to the organization of the National Association of Dental Faculties, and has undone within its borders the work of fourteen years." You, however, fail to state how this law undoes the work of fourteen years, the only point, in fact, that you attempt to make against the law being the clause which allows an application for examination to be made by a person not a graduate of a dental school upon the written recommendation of at least five licensed dentists of this State of five years standing, vouching for his qualification to take such examination.

It is a simple matter to prove that your deductions are false, and not in accord with those of other prominent teachers. Permit me to call your attention to portions of a discussion on a paper read by Dr. Jack before the Odontological Society of Pennsylvania, on November 13, 1892, entitled, "Should Examining Boards have Power to grant Certificates of Qualification to Undergraduates?" I think this will prove interesting reading in connection with cer-

tain utterances of yourself and the other gentlemen who participated in that discussion, a report of which was, I think, published in your journal, and which was afterwards published officially in book form by the Society. I quote from the book.

In his article Dr. Jack treats the subject in his usual broad and comprehensive way, and the discussion is opened by Dr. Peirce.

"*Dr. Peirce.*—I rather hesitate to express my views on this subject, as it is a matter of some delicacy, inasmuch as I am connected with a school, and it may be somewhat warped with my associations. There is one thing we need to remember, and that is not to confuse incompetent examining boards with competent ones.

"My views are that competent examining boards should be thoroughly prepared to examine and say whether the applicant is qualified to practise dentistry. If we have these, they are for the purpose of judging of the qualifications of applicants. They have no right in my estimation, appointed as they are by the Legislature, to ask the applicant whether he has a diploma, or where he got his education. All they want to do is to ascertain if the applicant is qualified to practise dentistry, and it matters not where that qualification is obtained, so long as he possesses it. While I have that feeling, still I concur in the sentiments of the paper as to disqualification of applicants who have come up before the board; yet the fact still remains that the law has no right to ask the question where the information was gained.

"*Dr. Kirk.*—This is one of the subjects, I must confess, in which I have only a limited interest. This centres so much in other directions that I have not sufficient to go round.

"If I understand correctly the statements made on this subject, that in the effort to obtain State legislation regulating the practice of dentistry, the committees have been met by the problem, the relation of State examining boards to college faculties. The Constitution of the United States and the laws of the various States are repugnant to anything that looks like class legislation, and a law which would prohibit any man from practising dentistry, unless he was a regular graduate of a dental institution, would savor of that idea. Dr. Peirce has very clearly shown that when he states that such legislation would inhibit the class who wish to become self-educated. As a matter of principle, I do not see any objection to saying whether a man should not qualify himself to practise dentistry. The question is, Can he do it? It is the function of the State examining boards to answer that question. . . .

"The State examination, if it is properly conducted, should be the barrier to the entrance of incompetent men into dentistry. Whether we should or should not examine men who have not passed a college examination, it seems to me, hinges on that point of the law in respect to class legislation.

"*Dr. Guilford.*—The remarks of Dr. Peirce pleased me very much, and he covered, I think, the ground very thoroughly.

"*Dr. Truman.*—I find very little in this question. I have been astonished at the first and last speech. Here is a dean who is not satisfied with the teaching of his own school. He wants the diploma discredited by having the board re-examine the students. It is astonishing to me. I do not care to have any board examine a graduate of the University of Pennsylvania. I question their ability to do it. I am opposed to this granting of certificates, and I am surprised that my friend, Dr. Guilford, should defend a practice that will certainly end in discrediting dental education. It would be better to return to the old plan of every man studying in private and securing a certificate from his preceptor. The majority of boards may or may not be good."

It seems to me that here we have a very careful handling of the subject by some of our most noted teachers, and it only seems to be necessary to point out the fact that it would be practically impossible for an unworthy man to procure the necessary credentials, and if he could not pass the examinations, he, of course, would not be licensed. But it might happen that an old practitioner—one thoroughly qualified and competent in every respect, still not a graduate of a dental school, but perhaps an M.D., or a teacher himself—might wish to remove to this State; this clause in our law would allow us to accept him, without which it would be impossible.

There is one charge against the New Jersey Board which you make that really has no bearing on the present subject, but which is so misleading that it should be exposed. You say, "The most persistent State in the Union to demand, through its board, a higher standard has been New Jersey; indeed, this board has recently declared it would not recognize any college that failed to come up to a standard far higher than that adopted by the National Association of Dental Faculties at its last meeting."

The standard for admission to the recognized list of New Jersey is that established by the National Association of Dental Examiners and, consequently, that of all States that are members of the Association. Whether they all live up to them or not is another matter. In New Jersey, if we agree to live up to a certain rule or

line of conduct, we do our best to carry out our agreement, regardless of the fact that some one may be hurt, who has, perhaps, been sailing under false colors, much to his own profit.

In the last paragraph of your editorial you not only ask for the repeal of the law, but say, "We have no doubt but that the best thinking men of New Jersey will take measures to effect this, for we are confident that there is a large body there who will not rest until this is accomplished." Now, it will probably be very gratifying to you to know—if you are not already acquainted with the fact—that there has been an association formed for the express purpose of fighting the law. It is composed of the owners, managers, assistants, students, and backers of the various "dental associations," "dental companies," "dental parlors," etc., throughout the State, some of whom are regularly licensed, but more of whom are not, who were, however, able, under the old law, to cover their actions by certain defects and deficiencies in its construction. These have, however, been remedied in the new law, and the breakers of the law and their abettors, brought to bay at last, are now doing the very thing which you advise in your editorial. This does not seem so strange, however, when we remember that back in 1890 this same class of professional (?) men and certain colleges of New York and Philadelphia were the only ones to oppose the bill then before the Legislature.

I congratulate you on the renewal of old associations.

Yours truly,

G. CARLETON BROWN.

Notes and Comments.¹

THE TRANSMISSION OF ACQUIRED CHARACTERISTICS.—At a recent meeting of the Academy of Stomatology, Professor C. N. Peirce gave a lecture on comparative odontology. He stated that his hearers probably appreciated the fact that he was a firm believer in evolution, an important factor in which is the tendency to variation. Variability in the development of all living beings is probably

¹ The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 1338 Walnut Street, Philadelphia.

an unyielding law of nature, and the question in which we are all interested is how certain forms become fixed. In other words, what is the force which establishes the shape and size of organs? A theory advanced by Lamark, which has long been accepted by many scientists, is that the long-continued need of a structure begot a movement which was originated and encouraged by the long-felt want, and in turn played its part in the development of the needed organ. Also that the force and efficiency of an organ was in the ratio of the use, exercise, or function of the organ. Thus the doctor attempted, by the exhibition of diagrams and natural specimens of jaws and teeth, to illustrate the correctness of this theory, explaining that the shape of the teeth and the infoldings of the enamel were due to the movement of the jaw and the force and impact upon the structures, these being the result of the food habit. And further, that these changes, when acquired, must be transmitted, or the theory of evolution would not be sustained.

WAVE-LENGTH OF THE RÖNTGEN RAYS.—It is stated that Dr. Fromm, of Munich, has determined the wave-length of the Röntgen rays to be fourteen-millionths of a millimetre, or about seventy-five times smaller than the smallest wave-length of light. It has also been found that the alkaline metals are the most transparent to the Röntgen rays; and according to Professor Marangoni, lithium is the most transparent of these. Sodium is more transparent than potassium, a fact which may indicate that transparency is proportional to the weight of the atom and the density of the metal.

STUDENT SOCIETIES.—Organizations among the students of our schools are rapidly increasing. They have proved of such value to the student's life that, in the dental department of the University of Pennsylvania, the Philadelphia Dental College, and the Pennsylvania College of Dental Surgery, there are at least eight active societies. This is another evidence of higher dental education, as the formation of debating societies must be of incalculable benefit in the forming of correct methods of managing such an organization and of presenting and discussing dental subjects.

REPLANTATION FOR CHILD.—*The American Dental Weekly* reports a successful operation upon a girl, thirteen years of age, who, while

walking in her sleep, fell upon a chair, which knocked out the left superior lateral incisor and cuspid. Four days afterwards she presented herself with the teeth in a bottle. The canal contents were removed, canals filled with gutta-percha, the ends of the roots were removed, the teeth were placed in warm carbolyzed water and then into formalin, the alveoli were cleansed, and the teeth replaced.

Current News.

NATIONAL DENTAL ASSOCIATION.

THE First Annual Meeting of the National Dental Association will be held at Omaha, Neb., commencing at ten A.M., Tuesday, August 30, 1898.

GEORGE H. CUSHING,
Recording Secretary.

N.B.—I wish to state, owing to the conflicting stories in circulation regarding lack of accommodations at Omaha, that I recently visited there to make personal inspection of the hotels, and found the accommodations ample and rates reasonable.

J. N. CROUSE,
Chairman Executive Committee.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

THE annual meeting of the National Association of Dental Faculties will be held in the Mercer Hotel, at Omaha, beginning Friday, August 26, at two P.M.

It is to be hoped that all members of the Association will be present at that time.

The Executive Committee will meet on the preceding Thursday at two P.M.

Colleges are notified to present their business at the first session of the committee.

By order of

JONATHAN TAFT,
Chairman Executive Committee.

B. HOLLY SMITH,
Secretary.

HARVARD DENTAL ALUMNI ASSOCIATION.

THE Harvard Dental Alumni Association observed its second Alumni Day on Monday, June 27, 1898, at the Dental School building, when nearly one hundred and fifty visitors registered their names with the committee in charge.

The work of the school for each year and class was shown by specimens and patients from all departments, and exhibited distinctive excellence.

The Twenty-seventh Annual Meeting and banquet was held at Young's Hotel, Boston, in the evening, with ninety-three present.

Rev. Edward M. Taylor, D.D., of Cambridge, Mass., the guest of the Association, spoke upon the topic, "The Man for the Twentieth Century," being a most interesting and timely theme. He touched upon the war, and said "it was the noblest that this or any other nation had ever waged."

Professor Eugene W. Smith, dean of the school, spoke of the progress of the school, and that the faculty had recommended the conferring of the degree of *cum laude* on students who spend three full years in the school and pass examinations in distinctive excellence. Professor Thomas Fillebrown referred to the post-graduate course and the entrance examinations.

Harry L. Grant, A.B., responded for the class of 1898.

These officers were elected for the ensuing year: President, Frederick Bradley, '86, Newport, R. I.; Vice-President, Edwin C. Blaisdell, '83, Portsmouth, N. H.; Secretary, Waldo E. Boardman, '86, Boston, Mass.; Treasurer, Harry S. Parsons, '92, Boston, Mass.

Executive Committee.—Waldo E. Boardman, '86, *ex officio*, chairman, Boston; William P. Cooke, '81, Boston; Patrick W. Moriarty, '89, Boston.

The Council is composed of the officers of the Association.

WALDO E. BOARDMAN,
Secretary.

Boston, July 1, 1898.

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Original Communications.¹

SECONDARY OPERATION FOR HARELIP.²

BY DR. THOMAS FILLEBROWN, BOSTON.

THE lip represented by the accompanying figures was operated on for closure of congenital fissure by the attending physician when the patient was an infant a few days old. The operation was very well done. An abundant length, vertically, of the lip was obtained, and complete closure of the fissure. Of necessity the upper lip was narrow horizontally, being not more than two-thirds the width of the under lip. This of course made the under lip pout forward, while the upper lip remained very flat, receding, and immovable. This is shown in Fig. 1. The patient was unable to widen it at all when laughing, or to raise it under any condition. The muscles were powerless to affect it.

The object sought by this secondary operation was the widening of the upper lip to equal the width of the under. I adopted the following plan, and the results justified my selection. The cheeks seemed to be the proper resource, and I proceeded as follows: I

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Presented at the meeting before the American Academy of Dental Science, March 2, 1898.

FIG. 1.



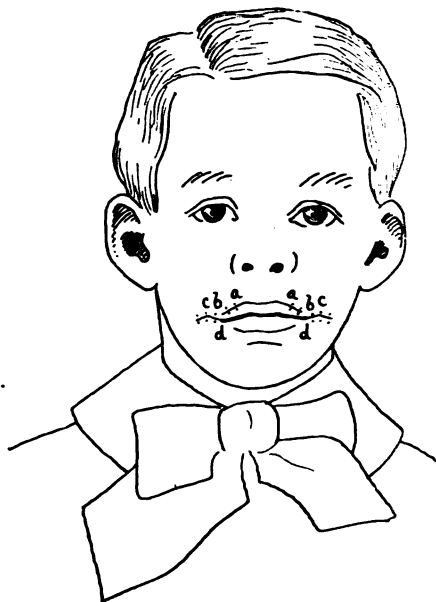
FIG. 2.



FIG. 3.



FIG. 4.



made the incisions *a b*, *a b*, Fig. 3, from the corners of the mouth backward a little more than half way through the cheeks. I then cut out and dissected off oblong flaps *e e*, Fig. 3, from the inside of the mouth, represented by the dotted lines, Fig. 3.

The parts were now free from each other, and I drew the flaps of mucous membrane through the incision and sutured them to the edge of the skin on the outside of the incision.

This made a red border for the additions to the lip. To gain the additional width I made a perpendicular incision from *b* directly upward one-half the length of the incision, *a b*. Then I straightened out the last incision, bringing the point *a*, Fig. 3, to *a*, Fig. 4, the point *b*, Fig. 3, to *b*, Fig. 4, and *c*, Fig. 3, to *c*, Fig. 4. The sutures on each side held the edges together on the outside and two within the mouth closed the gap left by the taking of the flap for the red border of the lip.

This carried all the new red border into apposition with the red border of the under lip and made them of equal width. The result is shown in Fig. 2. The size of his mouth was increased one-half. In two months the boy could show all of his upper teeth when laughing, and could give as good and hearty a whistle as any boy of his age, an accomplishment of which he was very proud.

The right nostril was considerably flattened and too large. A V-shaped incision, as represented in Fig. 3, corrected this feature and made the nares almost symmetrical. Of course, there was a slight fault in the orbicularis muscle at the corners of the mouth, but that almost wholly disappeared in the course of six months.

The general plan of the incision used in this case can be applied with advantage in many cases where sufficient tissue and mobility are not obtained at the first operation.

TREATMENT OF CERVICAL BORDERS.¹

BY SAFFORD G. PERRY, D.D.S., NEW YORK.

FROM whatever point it may be considered, the cervical border presents the weakest portion of every approximal cavity. It is inaccessible, it is anatomically weak, and, above all in importance, it is, from its position, most vulnerable to the insidious agents that destroy the teeth.

¹ Read before the Academy of Stomatology, April 26, 1898.

In considering this border, then, we have to contend with the most difficult conditions ever met with in the care of the teeth, for it goes without saying that the proximal cavities, as a class, are the most troublesome in the mouth. We can never be old enough, wise enough, patient enough, and accurate enough to care for this border too perfectly.

There is such great variety in the conditions found here that the operator is constantly meeting with cases that enlist his keenest interest and stimulate his highest ambition.

Logically, the first thing to consider is the preparation of this border for the reception of whatever filling-material may be used. Here we meet at once with an anatomical condition that must receive most careful attention.

I refer, of course, to the increasing thinness of the enamel as the cavity extends towards the root of the tooth. Of course, we must cut until we have reached solid structure, no matter how far we have to go, but here we are met by the question, What is solid structure? Strictly speaking we might cut up on the root, even above the border of the enamel, and not find it.

It may be answered that we had better do so if we cannot. To this I assent in most cases, but not by any means in all, for some teeth are in a condition that a solid border could not be found without going far under the gum, and then the cavity could not be filled and finished in such a manner that the gum would ever again remain perfect along this border.

I am convinced that ruthless disturbance of the gum is given little heed to by most operators,—by many, who still with a separating file destroy the perfect contour, in spite of all that has been written and said against this practice during the last twenty-five years, and by others who are such radical contourists that they cannot rest until they have cut even small cavities up under the gum, and made large fillings that shall have free edges, and that, along the cervical border, almost invariably leave a slightly disturbed condition of the gum, which bleeds readily when the floss silk or toothpick, and sometimes even the brush, are used.

More than twenty years ago, in an article on the treatment of the proximate surfaces, I advocated, in some cases, this free cutting of even small cavities, but I never supposed the system would be applied generally and to teeth of good structure. I have repeatedly seen cases from the hands of extreme contourists, where every filling on the approximate surfaces of bicuspid and molars ran far under the gum, and where that tissue at the cervical border

was ready to bleed freely at the slightest touch. I will grant that such fillings are safe,—none could be safer,—but in many of the cases I have seen the teeth of such good quality that I did not consider such radical operations necessary, for the teeth would have been safe with the filling that did not reach under the gum, and there would have been no disturbance of that tissue, and, besides all this, there would have been less display of gold, and infinitely less work and pain in performing the operations. In cutting, therefore, along the cervical border I believe it to be good practice to avoid going under the gums if the teeth are of good quality, and the general conditions in the mouth are not destructive. Please notice that I say in teeth of good structure. Yet, lest I be caught tripping here, in view of Dr. Black's experiments, which would seem to indicate that all teeth are nearly of the same structure, let me say, in destructive mouths.

Then, in cutting, the diminishing enamel must be considered, and in cutting a little more in the hope of getting a better border, there is danger of reaching such thin enamel, that it may be a question if there has been any gain by this more thorough cutting. It seems to me there is no ordinary operation where nicer care and judgment are called for than in the preparation of this cervical border. It is literally a "ragged edge," which one may approach too timidly, or over which one may too boldly go.

In the preparation of it for gold, there must be more thorough cutting than for any of the plastics, because the force required in condensing the gold might check and disturb an enamel border, which might be firm enough to receive a plastic. Then, too, the preparation must depend somewhat upon the gold to be used.

If cohesive gold is to be used there must be made one or two retaining points, or a retaining groove must be cut across the whole cervical border. If soft gold is selected, it may be that no retaining point or undercut will be needed.

It is probably safe to say that no dentist of experience can be found who would not be glad if he could be free from the necessity of ever making a retaining pit, or cutting a retaining groove in any tooth to be filled with gold. Then would be saved the devitalization of the border of the cavity caused by cutting the fibrillæ, the filling of a pit or groove which is likely to be imperfectly done, and the greater danger of crushing an enamel edge which has been weakened by the making of this pit or groove. But beggars cannot be choosers, and there must be retaining grooves in every cavity to be filled with gold.

Luckily, they need not always be at the cervical border, since the introduction of the matrix, which, making the fourth wall, becomes a great help in holding the gold in place, so that the retaining pit or the groove can be dispensed with in starting the filling, and when this is the case the mallet can be used without the fear of crushing the enamel edge, and with the certainty of making a perfect adaptation of the gold.

But if the pit or groove is omitted, there must be great watchfulness lest the gold may move after it has been condensed along the cervical border. I have had failures at this border years after when I felt certain that the gold had moved slightly without my notice before I had it securely keyed in by packing against the side walls of the cavity.

In a cavity which has been prepared along the cervical border without a pit or retaining groove, a mat of soft gold can be laid, extending a little beyond the cavity, and a matrix applied, pushing the protruding gold towards the neck of the tooth, and having the effect of holding the mat in place, and making it possible to get perhaps a more perfect adaptation of the gold to the extreme enamel edge of the tooth. My attention was first called to this by Dr. J. A. Woodward, and it has proved to be a point of practical value.

If one can have both hands free, so that the gold can be held rigidly in place for the upper third of the cavity, or until there is no chance of its moving from its place, the absence of retaining pits or grooves along the cervical border may be a clear gain. This may involve the need of an attendant to hold the rubber out of the way and reflect the light, and perhaps use the mallet. If the operator prefers to use the mirror in packing the gold, or to reflect the light and select a matrix that can be fixed to the tooth, a pit or groove at the cervical border may be necessary, since the left hand is not free to hold the first pieces of gold in place.

This feeling of certainty that the gold will stay exactly where it is placed is of great importance, and should make one pause in the preparation of a cavity to make mental comparison of the two systems. My own belief is that an operator should be as ready with one method as with the other.

In what I have said thus far, I have in mind the use of a soft gold such as Abbey's, Morgan and Hasting's, or Rowan's soft cylinders; either of these by slight annealing becomes cohesive enough to be packed as cohesive gold, and yet without entirely losing their soft quality.

A gold of this kind answers the purpose so perfectly that I

never use a strictly cohesive gold along this border. The introduction of the de Trey, as well as the Steurer gold, which seems to meet with much favor in some quarters, lessens the need of retaining pits, as this form of gold stays where it is placed better than any other, and can be used with less care in holding the first few pieces in place. Examination of the surfaces of fillings made of these golds shows an accurate adaptation, and it may be that they may yet prove to be most suitable along the cervical border. Any method that will encourage or allow delicacy in the treatment of this border is to be hailed as an advance. We appreciate this when we think of the days of cohesive gold and the sledge-hammer blows of the mallet.

It is really curious to notice how long a time is required for our profession to become conscious of the fact that the walls of even good teeth are frail and very destructible, and that cohesive gold is a very hard and unmanageable substance to use against them. The power of instinctive discrimination is not given to all, and perhaps it is not strange that we see so much poor work.

In the beginning I spoke of the inaccessibility and vulnerability of the cervical border. There is a qualifying condition which I have never heard mentioned. In every approximal cavity, in beginning the filling, the end of the plugger forces the gold squarely against the cervical border, and as the instrument is applied at right angles, the gold can be most easily and accurately adapted to the tooth with least force.

As the curve of the cavity is reached on either the lingual or the buccal aspect, this directness of application of force is lost, and this doubtless accounts for the fact that so many failures commence at this point on either the buccal or lingual sides of the tooth. By the time the cavity is about one-third filled and until finished the instrument is packing along the sides of the walls, instead of squarely against them. This natural position is the redeeming feature of the cervical border, and has made it possible for many botch operators to make fillings that were successful at this point. I am under the impression that some operators, appreciating this fact of the square application of the instrument along this border, use thicker mats or masses of gold than they are able to condense thoroughly, even though considerable mallet force is applied. I have repeatedly seen fillings that were solid and fine in other parts, and yet along this border were soft and even imperfect. In fact, I think we are all inclined to work too rapidly in packing the gold here, and also that we use the gold in too large masses.

For this purpose I have devised and used for many years plugger points which are adapted to bring pressure on the edge of the cavity, and which, being made flat on the side which rests against the matrix, insures a very perfect adaptation of the gold. These are made for the cavities on the anterior and posterior sides of the teeth respectively. It is not easy to describe their exact shapes, but I think they will be appreciated when seen.

There has been much said for and against a loose-fitting matrix, —that is, one that stands off from the tooth somewhat so that the gold can be packed a little beyond the cavity, thereby insuring a better adaptation at the edge. There is some reason in this, and yet it may be an open question if the time spent in finishing such a filling were given to packing the gold in smaller pieces, and with the instrument just described against a close-fitting matrix, an equally good edge would be secured.

The peculiar "rake" of these points makes it possible to make a perfect edge if one will be patient and careful. Of course, it is assumed that the matrix is bulged to conform to the natural shape of the tooth. If an equally good edge can be made with a close-fitting matrix, and as quickly, when the whole operation is considered, there is a gain in saving the patient the disagreeable task of trimming the gold, which generally results in disturbance of the gum from the use of files or chisels and the dreaded sand-paper strips. In the early years of the matrix I was shy of it, fearing the making of bad margins, but since having the plugging instruments described, my use of the matrix has increased, while my dependence on the separator has lessened.

A word more now, even at the risk of repetition, in reference to the cervical border. If gentleness and close care in filling are to characterize our method, and some soft or semi-soft gold is to be our main reliance, then I think we need not cut so radically in the preparation of this border.

Of course, this will be for the purpose of avoiding the encroachment upon the thin enamel, and to save the disturbance of the gum, as well as to make the operation easier for both patient and operator, as before stated. If it is said that we should not stop short of a radical operation, no matter what effort to the operator or discomfort to the patient, if it only betters an operation, then I reply, "Is it a better operation?" And when all the conditions are considered, I answer, "I think not." Nature is a safe guide, and I think we work well when we strive to leave a natural condition of the gum and of the teeth at the cervical margin.

It is perhaps a little curious that after the lapse of a quarter of a century I should have to ask for moderation in the application of a method which then seemed so necessary. But the confidence of youth is beyond belief. It is a divine quality, and springs from something in the blood that scorns delay and will not brook interference with the attainment of that perfection which is its dearest dream. What would we give to know again its divine thrill! To be carried by it beyond the bounds of reason, to know again its superb audacity. To scorn the wisdom of the universe in the confidence of its own dictum. But true to the inherent force that guides its movement, the pendulum ever swings back, and human progress is attained by rhythmic movements, that like the rising tide recedes only to creep a little higher on its return.

So I will not complain of radicalism, though I feel that now I know its danger. I now come naturally to the consideration of plastics in their relations to this border. And here let me tell you frankly that, for my appearance before you, I selected this subject partly for one particular purpose,—namely, to emphasize the danger of using oxyphosphate of zinc at this border without preceding it by some insoluble and indestructible substance. Oxyphosphate of zinc has been one of the most valuable acquisitions in dentistry, and it has been one of the most dangerous. I shall feel well repaid for whatever effort it has cost me, if I can only succeed in making a few members of the profession appreciate a little more fully the danger of using oxyphosphate of zinc along the cervical border. It may be that it is not generally used in this place, and that my anxiety is unnecessary, but it is my observation that it is generally so used here by most operators in this country and by those who practise abroad, and without being preceded by any other indestructible substance. I am sure there is not one of us who would not to-day be crippled in our practice by the withdrawal of oxyphosphate of zinc, and at the same time I believe there are not many of us who fully appreciate its danger.

In the beginning I said that the cervical border was the most inaccessible and most vulnerable of any cavity border in the mouth. If against this border you will use a substance so liable to chemical disintegration as oxyphosphate of zinc, you will have intensified the conditions of danger, and although you have delayed the evil hour of the tooth's destruction, you have established a set of conditions that in time will bring it about with almost scientific certainty.

It would not be easy to estimate the number of pulps that have become exposed by the treacherous washing out of this material

at the cervical border, thus allowing decay to go on quietly, without giving any intimation of its existence until too late. And the same may be said of the copper amalgam which was so much used a few years ago, and which dissolved at the cervical border in nearly the same manner. It left a dirty trail, and the memory of it is a nightmare. But we are not concerned with it in this paper, and let us hope it is a thing of the past.

What material shall we use, then, at the cervical border, if we have decided to put an oxyphosphate filling on an approximate surface? It depends upon the teeth. If in the front teeth, it should be gutta-percha or gold. If in the bicusps or molars, it should be gutta-percha, amalgam, or gold. I do not include tin, as that will be mentioned later.

The need of any indestructible substance is not so great in the front teeth as in the bicusps and molars. Any one of considerable experience will understand this. The teeth are not so broad and the cervical border not so sheltered, and the conditions taken altogether are not so treacherous. Gutta-percha is quickly applied to all these cervical borders, and has the great advantage of being safe. Though, of course, in a few years after expanding and bulging out so that it must be trimmed off, it will finally rot and have to be renewed. It is a very safe substance to use, however, as any bulging and rotting will be detected, owing to the fact that the oxyphosphate placed on it will wear away and have to be renewed in two or three years at the latest, and at each renewal the exact condition of the cervical border can easily be ascertained.

This combination for very badly decayed teeth, particularly bicusps, becomes in my judgment a very wise one to adopt. There will be generally two or three renewals of the oxyphosphate to one of gutta-percha. Teeth treated in this way may not increase one's reputation, because when the oxyphosphate wears away patients will come in saying the filling is out, but the operator can hear this undisturbed, because he knows at the cervical border it is safe and sound.

Of all the substances that can be used at this border in badly decayed teeth that must be treated with plastics I believe gutta-percha the safest. I will not say that I think it in all respects the nicest, for the bulging or the rotting will be noticed by careful patients who have the habit of passing the silk; but for absolute safety I think it is unsurpassed by any other substance, and for the reason that with it such a perfect adaptation can be made to the walls of the tooth, and because it has the preservative quality.

For many years I have in many cases protected the gutta-percha from wear by covering it with amalgam instead of oxyphosphate of zinc. In such cases I have filled the cavities nearly full of gutta-percha and then covered them on the grinding surface only with a rather thin filling of amalgam. I have known such fillings to last many years, but there is one danger,—namely, that of the expansion of the gutta-percha causing the thin walls of the tooth to split off. This danger is not so great, however, if the amalgam is only used on the grinding surface and the gutta-percha is left free on the whole approximal surface.

Gold can be used along this border to great advantage in many teeth so badly decayed that it could not wisely be used for the complete filling. The de Trey and similar forms of gold are very well suited for this purpose, as they can be so easily and accurately applied, as before stated. Amalgam for this purpose in many cases becomes invaluable. I have used it with a constantly growing confidence in its value.

Of course, you will understand that I am speaking of these three substances—gutta-percha, gold, and amalgam—only as foundations at the cervical border for oxyphosphate of zinc. This is no place for the discussion of the relative value of filling-materials, only as applied to the cervical border. I have not included tin, for while in some places I consider it the most perfect of all filling-materials, I do not trust it in sheltered places on proximate surfaces, and for the reason, of course, that it undergoes chemical dissolution. For this reason, many years ago, when it was advocated as well suited, pure or rolled with an alternate leaf of gold, for use along the cervical border, I distrusted it and used it but little. The few teeth that I ever filled in that way were afterwards repaired by replacing the softened tin by either gold or amalgam. If tin can be packed near to the edge of the enamel, and gold placed over it so that no tin is left exposed when the filling is finished, a durable filling may be expected. This is now done by Dr. Shumway, who finds that gold adheres to tin when rubbed onto it with ivory points. He rolls the tin in a compact roll and, cutting it in short pieces, anneals it over mica nearly to its melting-point, and after packing in the cavity he burnishes the surface with an ivory point and then rubs cohesive gold onto it. He claims the union between the metals is sufficient to make a fine filling, the tin being protected from wear or disintegration by the veneering of gold. To be successful, he says, the tin must be annealed and the filling protected by the rubber dam from even the breath. The results

of a clinic given last Tuesday before the New York Odontological Society showed that he makes no idle claim.

This is a proper place to add a few words in reference to the repair of gold fillings that fail at the cervical border. Purposely I did not allude to it while speaking of cavities that were to be filled with gold throughout. I have no means of knowing what is the general practice in these cases,—whether it is that of removing the whole gold so as to get access to the defective place, or that of simply cutting out the decay and repairing with gold or amalgam, or even with gutta-percha. My own practice has been almost invariably that of repairing the defective place, if the body of the filling is good. If the gum in such cases cannot be held away by the rubber dam, it can be by a suitably shaped instrument, so that access can be had to the cavity from both the buccal and lingual sides, and the operation becomes a very simple one either for the use of gold or amalgam.

If a large gold filling requires repairing at this point, it is more satisfactory to do it with gold if it can be done accurately; but if the defective place is inaccessible, a thoroughly durable operation can be made with amalgam. I consider this one of the best uses to which amalgam can be put. I have done so many with it in this way, and have seen them last so many years, that I have come to have great confidence in it for these places. The result is somewhat like that attained by using amalgam in the upper half or two-thirds of the cavity, and finishing with gold at the same sitting,—a method described first, I think, by Dr. Dwight M. Clapp, of Boston, and one that in my judgment has great merit in some cases.

The repairs I have in mind are only slight, however, and do not let the amalgam come in sight. The ability to make these repairs so easily is one reason why I am not so ready now as formerly to cut the teeth away so that each cavity on the proximate surface shall go under the gum.

There may be objection on the part of some to the use of amalgam for these repairs. I think the inherent objections to amalgam do not apply with the same force in these cases as when used for large operations.

Gold is very clean and beautiful, and amalgam is dirty and repugnant, but a man's professional duty to his patient should lift him above such considerations, and he should have the courage of his convictions, and the independence to use the means that will most easily and most surely make his work a success.

I have unstinted admiration for those who reject amalgam, in

particular, because it is a bad material in general; and yet there is a higher ground still to take, and it is reached when, laying aside all prejudice, one has the courage to use it in those few cases where for practical use and service it is the best thing we have yet found.

Sufficient unto the day is the evil thereof, and in this connection I am tempted to go out of my way to allude to a practice, much talked of a few years ago of anticipation of decay, by cutting between the approximal surfaces of good teeth. It had a grain of truth, but where is it to-day? Fortunately relegated with all the other fads of the enthusiasts to the limbo of the past. Besides disturbing the gum, it transferred the point of contact to to the cervical border, after the teeth had readjusted themselves, and made the conditions still worse when decay occurred.

I have now a word to add in reference to the illumination of the cervical border. On dark days I concentrate the light by the condensing lens, held by an adjustable rod attached to an upright, screwed into the iron frame of the movable bracket attached to the S. S. White Wilkerson chair. This intensified light, when it is possible, is reflected into the cavity by the ordinary mouth-mirror held in the left hand, or held by the attendant. Sometimes I reflect this concentrated light, or ordinary daylight, by a little mouth-mirror held by a rod attached to a weighted standard, which sets on the tray. The mirror is attached by a ball-and-socket joint, so that it can be set at any angle. For one who has no attendant this is convenient, as it leaves the left hand free to hold the gold in place in commencing a filling. These devices are somewhat in the way, but if one can become accustomed to them they are a real help. I have also used the electric light, but I have thought it rather trying to the eyes.

In closing, I wish to call attention to a certain form of matrix which I have found indispensable in the use of plastics at the cervical border. It is one which I call a hand-matrix, as it is attached to a handle which is to be held in the left hand. The matrices are made of thin steel with a lug soldered on the end which is to be placed on the lingual side of the teeth, and the handle soldered on the other. Some of them I have made from a single piece of steel, as the soft solder is affected by the mercury in amalgam filling, and they sometimes become unsoldered. If hard solder is used, so much heat is required that the temper of the steel is lost, and they do not keep their shapes as well as when they retain their spring temper. Those made from a single piece of steel are very durable. It is not, however, easy to make them wide enough for some cases,

therefore I have some of them made by soldering both with hard and soft solder. I have tried various metals, but I find that steel having a spring temper is best. The only objection is that in using oxyphosphate of zinc there will be some corrosion of the steel, but this can be partly overcome by touching the surface of the matrix on a sponge charged with oil before using. These matrices have one advantage over all others I have ever seen. Being held by the left hand, the operator has perfect control of them. The lug resting against the adjoining tooth near the gum secures a close fit at the cervical wall of the tooth to be filled, and by means of the handle the upper side of the matrix can be turned out and away from the tooth in such a manner as to give access to the cavity. After the filling is partly in, the matrix can be turned up to the tooth so that the contour can be kept. This adaptability of the matrix through the medium of the left hand makes it, in my practice at least, indispensable. The manner in which it opens up the cavity to light, as well as for the reception of the filling, must be seen to be appreciated. By pulling on it the lug draws it closely down at the cervical wall and holds it there firmly, and at the same time it can be turned off at the upper edge so as to reach the adjoining tooth, even though it is some distance away.

For this reason it is invaluable in cases where it is desired to exaggerate the contour of a tooth in order to close up a space. It is applied in an instant, and can be taken out and put back at any time, even though the filling is only partly in. For plastics it is almost perfection, and for gold it is also of great value. I have become so used to it that I use it for many of my gold fillings, in fact, for nearly all, where I can spare the left hand to hold it. It is so adaptable to the will of the operator that, having once become used to it, I cannot understand how it could be given up. I presented this matrix, with the illuminating devices described above, before the New York Odontological Society in 1893, and they were illustrated in the *INTERNATIONAL DENTAL JOURNAL* of that year. They have never been manufactured for the profession, and are therefore but little known.

I have to ask your indulgence for having treated this subject of cervical borders as if you were students, but I saw at once that it is one of infinite technical detail, and there seemed to be no other way. If I have so often described my own method, it has been because I could not in any other way so easily state what I believe to be the best practice. Emerson said, "Tell me what you do, and I will understand all the rest."

SOME PROPERTIES OF VULCANITE RUBBER.¹

BY S. E. DAVENPORT, D.D.S., M.D.S.

THE onward march of specialism in professions accounts for the entrance upon dental practice of many young men who have not been properly grounded in the making and tempering of instruments, the management of fusible metals, the designing of fixtures and appliances, and the proper use of all compounds and materials which belong more to the laboratory than to the operating-room.

We of the old-fashioned school, who were blessed with preceptors who, though destitute, perhaps, of high-flown theories, were very ingenious and had manipulative ability at their finger ends, were taught to make and use the laboratory adjuncts of our calling before we were allowed to operate upon the natural teeth.

I have felt for some years that there were dangers for our patients connected with this division and subdivision into specialties. The same mind should direct for each patient the strictly operative as well as the prosthetic needs, in order that the best result may be obtained.

Illustrations are frequent of a lack of harmony between partial dentures and important fillings in the same mouth, the plates having been made by one dentist and the fillings by another.

It should be a source of satisfaction to dentists in replying to the inquiries of patients that they have no specialties, but are willing to accept the responsibility of ministering to their patients' needs, whether operating, regulating, or the insertion of artificial dentures.

In accordance, therefore, with the opinion expressed above, that patients who require dental services of a varied character are better served, other things being equal, if those services can be rendered, or at least directed, by one man, I desire to add that the dentist who undertakes to render service of a prosthetic nature needs to possess full knowledge of all materials and methods used in the laboratory, even though he may be a very busy man in his operating-room, and not enter that laboratory except for the purpose of directing the workmen therein.

My observation and experience lead me to conclude that a knowledge of laboratory materials, methods, and appliances is distinctly unfashionable.

¹ Read before The New York Institute of Stomatology, June 7, 1898.

I take the liberty this evening of calling attention to some properties of vulcanite rubber which I think are not generally understood.

These characteristics are principally useful when changes are being made in old plates, the additions of new rubber or teeth, or the repairing of fractured plates.

I remember well, when practising in the country about twenty years ago, a man coming into the office with bottles of some fluid, the application of which to a rubber plate, he said, would enable one to stick new rubber to the old without subsequent cleavage.

My father, in whose office I was, expressed considerable amusement over this, for he had been adding new rubber to old without the use of chemicals for many years.

Vulcanite rubber, when forcibly pressed with a hot instrument against a clean, dry surface of rubber already vulcanized, will form, when vulcanized, a perfect union with the old rubber, and will break as quickly at any point as at the junction of the new and the old.

Should a rubber plate need a new block or tooth, the old block or tooth having been removed by the application of heat and the pressure of an instrument, a sharp scraper and engine burs should be used to cut away some of the rubber which held the block in position, particularly the portions in which the pins were embedded.

The new block now being ground and fitted for position, the old rubber is again scraped to insure a clean, dry surface, and small pieces of rubber should be spread upon this surface with a flattened instrument repeatedly heated in a flame. An instrument which is not sufficiently hot sticks to the fresh rubber and causes it to drag. When sufficient rubber is stuck to the surface, the block should be heated and pressed to its place, a cloth protecting the hand. Any rubber which may squeeze out should be trimmed off, the plate invested and vulcanized.

Fractured plates should be brought into proper position, the pieces being held with softened wax on the lingual surface until plaster can be poured upon the surface which fits against the gum.

The thickness of rubber should then be reduced by the use of sharp scrapers and burs, and one or more grooves may be made wherever the plate needs strengthening, for the introduction of pieces of roughened German silver wire.

When the wire shall have been bent and prepared for the grooves referred to, narrow strips of rubber are packed into the

grooves with a hot instrument, and the appropriate wire for each groove is warmed and pressed into the new rubber in the groove, the entire surface then being covered, wires and all, with rubber, piece by piece, to whatever thickness necessary, with the hot instrument.

This use of German silver wire in repairing fractured plates is particularly valuable in that it gives the required strength without the necessity of making the plate thick with rubber. Particularly is its use advisable in full dentures if the band be broken above the incisor teeth.

There is almost no limit to the use which may be made of this property of rubber, for it can be stuck to a plaster model with a hot instrument almost as well as to a basis of old rubber.

A few weeks ago a lady consulted me concerning a full upper rubber denture, the front teeth of which were too short, and as the plate had been worn a number of years, the suction was imperfect. There were reasons why it did not seem advisable to make a new plate, and as the lady had an older rubber plate which had been discarded some years before, I suggested that she allow me to experiment with that before doing anything to the one she was then wearing.

The laboratory man, under direction, first made a small groove all around the palatine surface near the edge of the plate, and packed into the groove with a hot instrument fresh rubber to form a ridge, or "Folsom," another one being made also around the air-chamber.

This surface of the plate was then invested in plaster and the six front teeth removed and replaced, two at a time, so as to be able to judge of their proper length and contour, the sockets being prepared for new rubber, which was packed in and the teeth lengthened as desired. The plate was then invested and vulcanized.

Although this plate had not been worn for at least five years, the suction was perfectly satisfactory fifteen minutes after it was put in the mouth, and while the "Folsom" ridge made the mouth sore and had to be partially scraped away at certain points two or three different times, within ten days the plate was as comfortable and as serviceable as a new one would have been.

This result being so satisfactory, the other plate was taken in hand and treated in the same manner except that the "Folsom" ridge was not made as high, and the lady did not return after the plate was put in the mouth, she sending me a note instead assuring me that the plate was comfortable and a success in every way.

Dr. J. N. Davenport, of Northampton, Mass., has made many partial rubber plates where he needs to use clasps, half-clasps, and small gold points to fit partially in between the teeth, without the use of a wax form. He takes a plaster impression, selects the teeth and grinds them to the model, fitting also the clasps and gold stays. The rubber is then packed directly upon the model with a hot instrument, the gold points, clasps, and teeth being placed accurately in position with the fingers, and rubber is packed about them as desired. The case is then invested and vulcanized, no opening of the flask or squeezing down being necessary, and much greater accuracy resulting.

No waxing up is necessary in any of these operations of addition or repair, the advantage being not only a great saving of time, but perfect union of new and old rubber and the ability to do in the hand accurately whatever is needed, eliminating all chance of malposition resulting from squeezing down in the flask.

I wish to impress upon my hearers that rubber packed in this way needs no undercut or dovetailed surface, a perfect union between the new and old rubber being obtained whenever the prepared surface of the old rubber is clean and dry.

Care should be taken not to touch the surface prepared for the new rubber, even with the fingers, for any interference with a freshly cut surface prevents perfect union.

Both the plate and the little pieces of new rubber should be at the temperature of the atmosphere, it being necessary to heat only the packing instrument.

Both the ordinary red and pink rubbers may be used as described above, but black rubber does not vulcanize well after the repeated application of a hot instrument.

THE FIRST MEETING WITH PATIENTS.¹

BY CHARLES A. BRACKETT, D.M.D., NEWPORT, R. I.

TWENTY-FIVE years ago, in front of this platform, my diploma as a graduate of this school was put in my hands by President Eliot. On that occasion it was my privilege to read my thesis to those who had assembled to do honor to the graduation of the class of 1873.

¹ A paper read before the Harvard Dental Alumni Association on June 27, 1898, on the occasion of their annual meeting.

Standing in the same spot, mindful that few quarter century anniversaries can come to any of us here, holding in esteemed and tender recollection numbers of most worthy workers in our calling then present, now passed on to their reward, and giving to all of you here to-day brotherly greeting, I am privileged to speak once more.

The subject assigned for to-day is an important one. The influence exerted by a dentist upon a patient in a first interview may be great and far-reaching, and may concern others than the two named. A first point to have in thought is the previous relations of the patient with other dentists. If one knows or has reason to suppose that a caller has been the patient of another practitioner in the near neighborhood, it is proper to seek to find out if the former relations may not be happily continued. If the caller express dissatisfaction with the treatment of any kind which has been received, I think that, in the majority of instances, a careful weighing of the statements and an inspection of the work will show that certainly or probably injustice is being done. I would not imply that all the perfection is on the side of the practitioner and all the imperfection on the part of the patient; but there are many things in the practice of dentistry of which none but a dentist can well judge. If we are able to restore to a questioner full confidence in a dentist who is worthy of it we have rendered the questioner a real service, we have saved our neighbor from injustice, and we have gained for ourselves the satisfaction of having done right from a worthy motive.

A few evenings ago I attended a meeting of a medical society, at which questions of ethics and of legislation regulating practice had been under discussion. After the adjournment it was my privilege to walk away with a lady who has been for many years a busy and successful practitioner of medicine. Referring to the discussion in which we had been participating, this lady said that if all doctors would conduct themselves with a high-minded honesty and nobility of purpose in their intercourse with patients and in their references to each other there would be little need for codes and laws. Too often there is a chain of circumstances like this: A patient is treated by a physician for a little time; dissatisfaction arises; physician number one is dismissed, and physician number two is called in. Physician number two is expected to express disapproval of what was done by number one, and number two meets the expectation and expresses the disapproval. I would not do injustice to physicians, but I think physicians themselves will admit that such

things as these occur, and occur when they should not. Nor do I believe dentists are perfect; but it has been my good fortune to live and practise for twenty-five years in a community where there have been for different parts of the time something like a score of dentists, and I have no recollection of there ever having come to my knowledge in that time any unkind, insinuating, or disparaging remark made by any Newport dentist concerning the work of any other qualified dentist in the city.

It being settled that the caller is one who has just claims upon our service, it becomes incumbent on us to make that service as real and as acceptable as possible. At the outset we should seek to inspire in the patient confidence in us. Confidence is at the foundation—is the foundation—of all the worthy relations which individuals may have one with another. Go over in your minds all the interrelations and interdependencies of humanity and see how trust and confidence underlie and permeate the whole. Any one who ministers to any of the many ills to which flesh is heir comes into peculiarly intimate and confidential relations with those whom he serves,—confidential, because honor is involved; confidential, because, literally, confidence is involved. We need the patient's confidence in our professional capacity, and not only in our capacity but in our worthy intentions, in our honesty, in our sincerity, in our sympathy, in our faithfulness. If that confidence is not felt by the patient, there cannot be that cordial co-operation with us essential for the readiest attainment of the desired result, nor can we render the best service of which we are capable.

Now, how shall we inspire this confidence? Just simply by deserving it. In our neighborhood, in our office appointments, in our neatness, in our dress, in our manner, in our daily walk and conversation, in our personal self, and, most of all, in our mind and heart and soul, which is the real man, and which inspires and controls all the external expressions of the man, there should be the effort towards worthiness. Politeness is well, but politeness to be of any real value must be the expression, spontaneous and refined, of a kind heart, thoughtful for the comfort and happiness of others.

Blessed and blessing is the man or the woman who has tact, who does not see little mistakes and awkwardnesses in others, who can unobtrusively drive away bashfulness, aid the timid, encourage the shrinking, quiet the disturbed, make peace with the angry, and comfort the suffering. We should have high conceptions of our opportunities and responsibilities, of our privilege and duty to de-

vote to useful and worthy ends the powers with which a kind Providence has endowed us.

When the new patient comes in we should show interest in the object of the visit and an earnest desire to render the service which the case requires. We should have patience in listening to what the patient may tell us to aid in the diagnosis, being at the same time mindful of using our own powers of discrimination. We should show deference to age, to peculiarities of temperament, to some extent even to "notions," if thereby the patient's interests are served. We should show kindness, patience, sympathy, and we should remember that in all of these things actions speak louder than words. Try not to impose upon the patient things especially repugnant unless they are really needed. Studiously avoid all careless and unnecessary hurts, and be firm and steady in making those hurts which are inevitable. Be ready to give good reasons for all that you do, and give warning in advance of anything that is likely to be particularly painful. Never deceive, and especially do not deceive a child, nor allow any one else in your presence to deceive a child in regard to an operation which you are to perform. If possible, so win its confidence that it will submit voluntarily to what must be done, but it is better to control its body by force than to warp its soul by deceit. Capacity to win the confidence of children is usually a measure of one's merit for the confidence of older persons. Of one of the contributors to this symposium, a lady, said, "Dr. C. quite won my heart. My little girl was ill in bed, and while she was ill she had a toothache; Dr. C. came to the house to comfort her, and from his kindness and goodness to my little daughter I knew that he must have children of his own."

Do not be pompous. No one gains in that way any respect worth having. Do not be familiar, "Familiarity breeds contempt." Do not be a "know-it-all," and do not try to "show off" in any way. Do not talk too much; do not talk too little; but better too little than too much. Do not ask irrelevant questions. Avoid everything of a gossipy nature. Do not talk of one patient to another patient. Try to say nothing that quoted to anybody anywhere might do harm, and remember the inaccuracy of usual spoken quotations.

Be cautious in diagnosis; seek to set aside as much as possible sources of error. Avoid too much positiveness. Be brave; be not too brave. Be very careful about definite promises. Guarantee nothing except faithful effort to accomplish the service needed. Impress the patient with the fact that the patient's interests and

your interests are not antagonistic, but identical, and that your satisfaction in the matter must be consequent, in a measure, upon the patient's satisfaction.

Have some experience yourself in the dentist's chair occasionally, and be so mindful of that experience as to try and do as you would be done by. The man who would have friends must show himself friendly. Animals respond to the treatment which they receive, according to its nature. They shrink away from those who have abused them, who have played tricks upon them, who have been cross to them, while to those who have treated them fairly and who have shown them kindness, they return unmistakable evidences of confidence, and often of the most devoted affection. Human beings, as well as horses, dogs, and cats, have some powers of discrimination.

It is an honor to any dentist to have it truthfully said of him that his patients are his friends. There is reward and inspiration in that. In obituary notices of worthy men we often read that he who has passed away had enjoyed during his life the confidence of all those with whom he had business relations, or that he had enjoyed the confidence of the community in which he lived. It has always seemed to me that there was a particular appropriateness in the word enjoyed in that connection.

The expressions of confidence and trust in us, and of grateful appreciation of efforts which we have made to render service, as these expressions come to us day after day in our busy lives, are among the most pleasant rewards which we can have. They cheer the toil and lessen the fatigues of the present, encourage us to go on to do the work of the future, and inspire all our nobler nature to try to be worthy of the estimation in which we are held.

Abstracts and Translations.

WHY COAGULANTS DIFFUSE THROUGH DENTINE.

BY E. LAWLEY YORK, D.D.S., F.R.M.S., ENGLAND.¹

ABOUT a year ago I had the honor to present to this society a paper on "The Diffusibility of Coagulants in Dentine." The deductions I drew and the experiments I exhibited at the time

¹ Bacteriologist in Chicago College of Dental Surgery, Chicago, Ill.

showed you conclusively that carbolic acid would diffuse through dentine. Hearing that I was continuing this line of investigation, the chairman of your Executive Committee did me the honor to request me to read another paper along the same lines, and from the generous and kindly manner in which you received my former effort, I consented. The following is the result of my experiments extending over the past year.

If you remember, I stated at that time that I found that there was greater rapidity in the diffusion of carbolic acid through the dentine of a tooth that had contained a putrescent pulp (four to eight hours). This occurred not once only, but in every case, and it set me thinking. Why was there greater rapidity of diffusion in such a tooth and less in one that had contained up to the time of treatment a normal pulp? In the latter we had to deal with a tooth that had so far not undergone any pathological changes, either in the contents of the pulp-chamber or the dentinal tubuli, all the albumen that is normally in a tooth being there intact, whereas in the tooth the pulp of which had died, and as a consequence undergone the process of putrefaction and the consequent formation of an innumerable number of end-products, we had a totally different condition to deal with. In the first condition we might have an infinitesimal quantity of albumen to deal with, as I will show you later, whereas in the latter we have none, as I will now endeavor to demonstrate.

Many mouth-bacteria, as well as the majority of the pyogenic and putrefactive bacteria, have the faculty of dissolving coagulated albumen or albuminous substances, of peptonizing or converting them into soluble substances, just as albumen is converted into soluble peptones by the pepsin of the gastric juice. Micro-organisms nourish themselves only by substances in a state of solution, and if we present them solid substances they must first liquefy these substances before they can make any use of them for their own nourishment.

After the death of a pulp it is invaded by various bacteria, strictly saprogenic as well as pathogenic, the result of which is that the pulp becomes a foul, semifluid mass. This putrefactive decomposition of albuminous matter is effected by a great variety of micro-organisms and gives rise to a great variety of products, some of which are volatile and are characterized by their offensive odors. This putrescence was the result of, first, the splitting up of the albumens into peptones, which according to Flugge may be effected by a number of micro-organisms, then the splitting up of

the peptones into a large number of gases, acids, bases, and salts. Among the products of putrefactive fermentation known to chemists are the following: Carbon dioxide, hydrogen, nitrogen, hydro-sulphuric acid, phosphuretted hydrogen, methane, formic acid, acetic acid, butyric acid, valerianic acid, palmitic acid, crotonic acid, etc. A few words on ptomaines may not be out of place. It is a name suggested by the Italian toxicologist, Selmi, and derived from the Greek word *πτωμα*, meaning a cadaver.

A ptomaine may be defined as an organic chemical compound, basic in character, and formed by the action of bacteria on nitrogenous matter. They have also been called animal alkaloids, but this is a misnomer, because, in the first place, some of them have been found in the putrefaction of vegetable matter, and in the second place, the term animal alkaloid is more properly restricted to the leucomaines, those basic substances which result from tissue metabolism. While some of the ptomaines are highly poisonous, this is not an essential property, and others are entirely inert. Hence the severe and complicated conditions following in some cases a blind abscess, or the opening of a putrescent pulp-canal, where we have exercised the greatest care. Since all putrefaction is due to the action of bacteria, it follows that all ptomaines result from the growth of these organisms. The kind of ptomaine formed will depend upon the individual bacterium engaged in its production, the nature of the material being acted upon, and the conditions under which the putrefaction goes on, such as the temperature, the amount of oxygen present, and the duration of the process. Ptomaines are the transition products in the process of putrefaction. They are temporary forms through which matter passes while it is being transformed by the activity of bacterial life from the organic to the inorganic state. Complex organic substances, such as muscle and brain, are broken up into less complex molecules, and so the process of chemie division goes on until the simple and well-known final products, carbonic acid, ammonia, and water, result.

It is an established fact, and will be borne out by the experiments which I will give you later, that the end-products of albumen decomposition, or putrefaction, are no longer coagulable. I previously stated in this paper that the first step in the process of putrefaction is the transformation of the albumens into peptones. Now these peptones are not coagulable; for example, if you take pepsin and add it to serum albumen and allow it to digest at body temperature, you will find it is converted into peptones, etc., which

are not coagulable. This is precisely the same condition that we find produced by the action of peptonizing bacteria upon proteid matter. (Here exhibit tubes of decomposed serum albumen, and tubes of serum albumen to which has been added pepsin.) On the addition of carbolic acid they do not coagulate.

Now, how does carbolic acid act upon these substances? Does it coagulate the orificial ends of the dentinal tubuli, and seal in all this poisonous matter? Most emphatically no. The carbolic acid will penetrate as well as anything else you may use.

Let us now take another view of this much mooted question and see how the carbolic acid will act in the dentine of a tooth in which you have removed a normal pulp, one in which the albumen has not undergone decomposition. I stated earlier in my paper that carbolic acid diffused through the dentine of a tooth from which I had removed a normal pulp a trifle slower than one which contained a putrescent pulp. The reason for that was this: that carbolic acid did coagulate the trace of albumen that was there, but the former (carbolic acid) being in excess, the coagulum was redissolved. I will now show you capillary tubes filled with serum albumen (human), native albumen, and artificial serum albumen, and you will notice the coagulation proceeds slowly, and, following behind a trifle slower, you will see that the coagulum is being redissolved. This is precisely the thing that occurs in the dentinal tubuli, only we have such a minute quantity of albumen in the tooth-structure that it is hardly a factor.

To demonstrate the latter statement to your satisfaction I will give in detail some experiments made to determine the quantity of albumen in a tooth.

Determination of Albumen in Teeth.—The teeth are first thoroughly scraped, removing as much of the adhering particles as possible. They are then carefully brushed with alcohol, which coagulates the albumen on exterior of the teeth. After the teeth are dry they are finely pulverized.

To this pulverized substance (about ten grammes) is added a decinormal sodium chloride solution (about twenty-five cubic centimetres) alkalized with sodium carbonate. This is thoroughly agitated and allowed to stand for thirty-six hours. During this time the mixture is frequently shaken. It is then filtered until a clear filtrate is obtained, and washed. The filtrate is acidified with dilute acetic acid and brought to the boiling-point. This coagulates the albumen. It is allowed to stand for some hours until the coagulum settles and the particles become agglutinated. It is then filtered

upon a counterpoise filter. The precipitate is then washed until no reaction occurs upon the addition of a solution of silver nitrate.

The contents of the filter are then dried at a temperature of 110° C. for about thirty minutes, then placed in a desiccator and afterwards weighed. The albumen is repeatedly dried until a constant weight is obtained.

The tooth-substance, after being treated as above, was again subjected to the same process, but yielded only a faint trace of albumen, showing that practically all the albumen had been removed.

7.5 grammes (115.74 grains) yield .0028 gramme ($\frac{7}{1000}$ grain), $\frac{37}{1000}$ of one per cent.

9.5 grammes (146.60 grains) yield .0067 gramme ($\frac{67}{1000}$ grain), $\frac{7}{100}$ of one per cent.

11.5 grammes (177.46 grains) yield .0060 gramme ($\frac{6}{100}$ grain), $\frac{6}{100}$ of one per cent.

(1) These analyses of the teeth will clearly show you that the amount of albumen in a tooth is of too minute a quantity to be a factor. This applies to a tooth the pulp of which was in a normal condition when analyzed. (2) A tooth the pulp of which has undergone the process of putrefaction of albumen decomposition. The end-products are no longer coagulable. (3) Had we as large an amount of albumen in a normal tooth as we have always been led to believe, the quantity of carbolic acid which would be accommodated in the pulp-chamber and canals would be quite sufficient to redissolve any coagulum that would be formed.

Recapitulation.—I have shown you capillary tubes containing egg or native albumen, serum albumen (human), and artificial albumen, all of which coagulate in the presence of carbolic acid, and you will also observe redissolve in an excess of carbolic acid. None of these have undergone decomposition. I have also shown you capillary tubes filled with decomposed serum albumen (human), and gelatin and serum albumen (human), acted upon by various pathogenic and mouth bacteria, none of which show any sign of coagulating in the presence of carbolic acid.

After getting these uniform results by repeated experiments hundred of times, and drawing my own deductions from them, I was naturally anxious to communicate with others who might have been over similar ground in search of other subjects. So I accordingly opened up a correspondence with Professor Vaughn, of Ann Arbor, on the decomposition of albuminous substances, and will give you his reply: "There can be no doubt that the end-products of albumen decomposition are no longer coagulable."

Professor Klebs, of world-wide reputation, also states that they are no longer coagulable, as also does Professor Hektoen, of the bacteriological and pathological laboratories of the Rush Medical College.

Before closing, I have to thank those gentlemen for their courtesy in answering my questions, and also to express my indebtedness to Mr. O. T. Roberg, of the chemical laboratory of the Rush Medical College, for his valuable assistance in making the quantitative analyses of tooth-substances.

The books I have consulted and freely quoted from are "Ptomaines, Toxins and Antitoxins," by Vaughn and Novy; "Micro-organisms of the Human Mouth," Miller; McFarland's "Bacteriology;" and Sternberg's "Bacteriology."—*The Dental Review*.

Reports of Society Meetings.

THE NEW YORK INSTITUTE OF STOMATOLOGY.

A MEETING of the Institute was held Tuesday evening, June 7, 1898, at the residence of Dr. C. B. Parker, No. 167 Remsen Street, Brooklyn, the President, Dr. E. A. Bogue, in the chair.

The minutes of the meeting held at the Windsor Hotel on the afternoon and evening of May 3 were read and approved.

Dr. S. E. Davenport presented a paper on "Some Properties of Vulcanite Rubber."

(For Dr. Davenport's paper, see page 579.)

DISCUSSION.

Dr. Davenport.—One of the samples which were passed around, of thin vulcanized rubber, is made by the addition of new rubber to old, exactly end for end, the piece of rubber first vulcanized being filed as flat as possible on the end with a fine file, new rubber being attached to the filed end with a hot instrument and vulcanized a second time.

The President.—Dr. Davenport's paper is open for discussion.

Dr. W. St. George Elliott.—Of course, we all have our different ways of doing things, and for many years, to some extent, I have carried out this same practice; but there was a suspicion in my mind, until to-night at least, that the union has never been a very

perfect one, and I have always felt called upon to use some dovetailing or its equivalent. My ordinary way is to clean the surface thoroughly and use a small wheel burr, with which I scarify the surface; in that way I get a very good union, with the addition of chloroform to get a clean surface. But I am very glad, indeed, that Dr. Davenport has undertaken these experiments, because it is a step in the direction which is so important to us as a profession. We are so inclined to the empirical; we do a thing because we are told to do it, or because it is the way we have always done it.

Dr. J. Adams Bishop.—I am very much interested in this line of work, and am sorry that Dr. Davenport did not say something about the vulcanizing. How is the rubber to be cured? I would like to ask Dr. Davenport if he had an upper and an under denture, and sent them to the laboratory, how he would like to have them vulcanized?

Dr. Elliott.—In England it is a rather common practice to vulcanize without the use of investments in the ordinary way,—that is, the rubber is fastened directly to the model by cement, then packed in anything which will keep it in form, sometimes in sand, sometimes in powdered soapstone or like material, merely to keep the parts in their respective places; it is then vulcanized. Several articles have recently appeared in the journals advocating this same method.

Dr. A. H. Brockway.—I was also disappointed that Dr. Davenport did not say something about the process of vulcanizing, for I am inclined to think that is something not so well understood in practice as it should be,—that is to say, many dentists fail to get as good results as they could if they knew just what to do in the matter of vulcanizing. I have not done much of that kind of work of late years, but I have done a great deal of it in the past, and I think the finest piece of vulcanite work that I ever did was the first piece. I kept the little experimental plate for a good many years, and it had a toughness and strength that I was never able to equal afterwards, and I attribute it to the fact that in my ignorance of the process I vulcanized it at a low heat and for a long time. It seems to me that I get better results in that way than I did by the usual process of vulcanizing at 320° F. for an hour or so. I have seen a good many plates that seemed to me to lack strength from some failure to properly vulcanize.

Dr. McNaughton.—I have been working on this thin piece, and find it has broken in two, one-third of the break being in the old crack, the rest being a new break.

Dr. J. Adams Bishop.—I only wish to say that vulcanite rubber, which has now been in use for more than thirty years, is one of the most useful materials that our profession has for the making of plates. I think it has a value almost as great as gold or platinum, increased according to the nicety of its preparation for the mouth. The passing of our models from the office to the laboratory is where the annoyance comes in, for there they are rushed through as rapidly as possible, with little regard to vulcanizing, cleanliness, or finish. If all of these things were carefully worked out it would make clean and healthy plates. I have seen it under all conditions, in and out of the mouth, and think more can be done with it than with any other material we use.

Dr. F. Milton Smith.—Dr. Davenport's paper was to me decidedly interesting. The thought occurred, as it has so many times before, why was it that for so long a time we did not appreciate the fact that new rubber if applied to clean rubber will stick there? It seems so simple when we have once tried it. The thing to know is, that the surface shall be absolutely clean and fresh; then the new rubber will cohere strictly. I do not believe it is necessary that a single mark should be made on the old rubber if it is clean and fresh. Day before yesterday I had occasion to repair a plate quickly, and I am one of those unfortunates who sometimes do a little laboratory work. My patient had two teeth extremely loose, and it was necessary to remove them. She was anxious to have new ones as soon as possible. I removed the natural teeth, and in a very few moments had made a model of the plate, had scraped it away, fitted the teeth, packed the rubber, and had it in the vulcanizing flask. It seems to me that by this method we save two-thirds of the time.

Dr. Davenport.—I think too much emphasis cannot be placed upon the necessity of having a perfectly clean surface, and that it must also be a dry surface, or success will not come. The old method of undercutting was absolutely necessary if the plate was to be heated and steamed, because with the moist surface there would be no cohesion unless there were undercuts; but with a dry, clean surface not a mark is necessary, as Dr. Smith has said.

Referring to the statements that nothing was said about vulcanizing, I am reminded of what Kipling says,—“That is another story.”

The President.—I do not know that it is very far out of the line to recall the experience of one of our French friends whose vulcanizer blew up, and who had a piece of work which had been

promised at a certain time. He remembered that glycerin was susceptible of being heated up to 320° , so he took his flask and put it in the glycerin and vulcanized successfully.

Dr. C. A. Woodward.—I have a case in practice to report, which, I think, is unique. Some four or five months ago a gentleman called upon me, who had been told that I sometimes implanted teeth. He informed me that his wife, some months before, had been taken with a severe illness, and during that time had lost her mind. Always before her illness she had been very proud of her teeth, as they were rather handsome; but after insanity came on, she became possessed with the idea that those teeth should be removed, and she set to work to get them out. Her age was about forty, and her teeth were as firm as any teeth generally found. During her early life she had lost a sixth-year molar, and between the molar and second bicuspid was a space into which she could get the handle of a spoon or fork. She finally succeeded in removing the two bicuspids. After that she would catch hold of a chair or a table, or anything that she could seize with her teeth, and pull with so much force that she broke the outer alveolar plate, so that it came out in one piece. After that, of course, it was very easy to remove the other teeth.

Upon an examination of her mouth, I saw that it was impossible to implant the teeth, owing to the loss of the alveolar process. She was extremely anxious to have her own teeth replaced in her mouth, and had the idea that it could be done, and, although I told her it was impossible to implant them, she said that I must devise some way of putting the natural teeth back.

After much thought and consultation with others, I succeeded in mounting the natural teeth upon a gold plate. I cut off the roots about one-half their length, keeping the other half to give strength, and set the natural teeth into wax as we do ordinarily, then withdrew the teeth and vulcanized the plate. After vulcanizing, I cemented the natural teeth with zinc phosphato upon the little screws in the sockets that had been made, and the accuracy and nicety with which the teeth were replaced surprised and pleased me, so accurately, indeed, that one can hardly detect that they were replaced. I may say that the teeth have been worn now about four months, and I see no reason why they should not give as much service as porcelain teeth do, and they are, of course, most natural in appearance.

I will give another little case in practice. A gentleman a week or two ago came to me with a piece of bridge-work, consist-

ing of four incisors that he had worn for some years. Since then he had lost the bicuspid, and wished a new piece put in, with the bicuspid added to it. He was a public speaker, and it was very necessary that in removing the old piece they could be replaced again, as he could not go without them at all while making the others. Upon examination, I found that they were very firm in the mouth, and it was a query how I should take them out without destroying the bridge. I made a remark to him that I should be very lucky if I could remove the bridge without breaking one or more of the teeth. He replied, "I will take care of that part of it; you need not be alarmed about that," and said, when the bridge had been in the mouth but a short time a physician prescribed for him the vapor of listerine thrown into the mouth as hot as it could be borne and as long as he could bear it. After using the listerine, he found that his bridge-work was so loose that it nearly dropped out. I was incredulous about it, and thought it might be from some other cause. However, I told him that before he came the next time he could apply the hot listerine, and I would see what the effect was. He applied it just before coming to my office, and the bridge was so loose that he had hard work to get to the office without dropping it out. What the action of listerine is on zinc phosphate I have not had time to determine by experiment; but the bridge was very firm before applying it, and after applying it for ten or fifteen minutes the zinc phosphate was very soft and the bridge came out easily.

Dr. Davenport.—I wish to call attention to one phase of this case which Dr. Woodward said nothing about, and that is the determination of the gentleman who designed and carried out this most remarkable scheme that it should go through successfully. I happen to know a little something about it, as I was one of those consulted by Dr. Woodward, and, with the rest, discouraged him; and if he had taken the advice of his friends he would not have attempted it. However, his great success in New York City has probably been due more to himself than to the advice of his friends, and this remarkable success which he has exhibited to us to-night is a good illustration of that.

Dr. Woodward.—It is true that, upon consulting with Dr. Davenport and others, I was discouraged about my ability to vulcanize teeth. But when I get into a corner and do not know what to do, I have gone to our worthy president, Dr. Bogue. I think on that occasion he told me that to vulcanize the screws into the plates and then replace the natural teeth in the sockets with zinc phos-

phate would be the best thing. I carried out his suggestion, and I believe with perfect success.

Dr. Louis C. LeRoy.—With reference to the attachment of natural teeth to vulcanite, the only other instance which I recall is a practical case in possession of the S. S. White Dental Manufacturing Company as an exhibit of the skill of the Japanese or Chinese in the reproduction of work representing nature. They have a set of natural teeth built in a celluloid base. Of course, the supposition is that we cannot vulcanize or raise the heat of celluloid to a point to cause the same to flow about natural teeth without disintegrating them. The process as performed by Dr. Woodward is a wonderful piece of work; there seems to be a union as perfect as vulcanite would form with the natural teeth and the base upon which it is built. Dr. Woodward's work is in line with the beautiful art.

Dr. Woodward.—I have been told by a gentleman who has had some practice that to vulcanize natural teeth will destroy them; that when coming out of the plaster they will crumble to pieces by the heat of the vulcanizing.

The President.—I want to disclaim all originality. I have seen much of that work done on the other side of the water, but I do not know that I have seen anything prettier than this. Nevertheless, many natural teeth are set on vulcanite plates over there with the most beautiful results. Many of the attachments are made with sulphur, others with zinc phosphate; but I rose particularly just now to say that it seems like a reproach to all of us that, in view of the accuracy with which teeth can be fitted into a wax plate and withdrawn, a vulcanite plate made, and the teeth put back, we still continue to vulcanize on our models, always destroying them. It is getting to be rather a hobby with me to refer to a French workman who worked for me for eleven or twelve years, and who used to make his articulating models, keep the wax plate with which the bite was taken to set up his teeth upon, and bring back my plates on the articulator. I have experienced more comfort and profit from that sort of work on the other side of the water than I have experienced in New York.

Dr. Elliott.—Is it not the ordinary custom on the Continent as well as in England to always preserve the models?

The President.—It is, and we are making a constant mistake here in destroying our models. I heard a gentleman at Albany the other day speak of repairing rubber plates. He said something that was, a good deal of it, new to me. Instead of making an investment completely of plaster, he made his model for the investment by

pouring in very fine plaster and shaking it out, and then for the rest of his model he poured plaster and pumice-stone, by which he said he neutralized the usual contraction of the plaster which always annoys us when we undertake to make repairs.

Dr. Elliott.—For many years the use of natural teeth has been more or less common; but we have always been taught that natural teeth will not answer the purpose; that they are porous and are always disagreeable, added to which it is a well-known fact that they will decay in the mouth. That has been noted over and over again. Upon one occasion I made a gold suction-plate for a Japanese official. The suction was not what it should have been. He went away and in two or three weeks he returned for me to make another, and he took out of his mouth a duplicate of my plate made of wood, copying my air-chamber and everything complete, with natural teeth inserted in the wood and held by a string. It was very beautifully done, and my gold plate he was carrying in his pocket.

The President.—We shall be glad to hear the report of the Committee on Operative Dentistry, of which Dr. Allan is chairman.

Dr. Geo. S. Allan.—In spite of the fact that the work of our committees presents many difficulties, I feel that much may be accomplished and the Institute greatly benefited. As usual with committees, the chairman has most of the work to do, but much of each chairman's effort should be directed towards interesting the other members of his committee in the work and securing their co-operation. I feel that it is fortunate for us all that my committee has secured from Dr. Raymond his promise to present some things of importance this evening.

Dr. E. H. Raymond.—The life-work of the dental practitioner is made up largely of saving teeth by filling them,—reconstructing those organs that have been impaired by processes of decay. Up to the present time, gold, in its varied forms, has been the standard as a filling-material. There are special cases, however, where, for the sake of appearance, general safety, and utility, solid gold fillings are not advisable. Where there is cervical decay,—that perplexing form of disintegration we so often find on the necks of the anterior teeth,—gold is not always the best material to use in checking it, as it is objectionable on account of its color. The most appropriate material for this work is porcelain. It approximates nature more closely and gives greater satisfaction, especially to our lady patients.

In 1873 I placed a section of porcelain, an inlay, on the labial surface of a superior central, for a gentleman in this city, cutting

it from a plate tooth, and cementing it in with oxychloride of zinc. It proved so successful that ever since that time I have resorted to that method of filling wherever the conditions warranted it. That first section of porcelain is in the mouth to-day, but it has been reset with zinc phosphate.

About eight years ago I had occasion to treat some teeth for a young lady from the South, in whose mouth there was a marked predisposition to cervical decay. Her teeth were very white and beautifully formed. They had deep grooves along the cervical margins, which, had they been filled with gold, would have been very conspicuous, and would have spoiled the appearance of her mouth. I selected some porcelain sections, and shaping them with fine corundum stones, cemented them in with the zinc phosphate, using the rubber dam to keep them dry during the process. They are scarcely noticeable, even by her intimate friends.

In the models which are presented, it will be noticed that in one of them the decay has extended some distance beyond the gum-line. In this I have placed an inlay of porcelain gum, cutting it from a plate-tooth. A white inlay in such a cavity would make the tooth abnormally long and spoil the symmetry of the arch.

I prepare the cavities for such work in the usual way, making the undercuts a little deeper around the edges. Care must be taken not to cut too much from the centre of the cavity, for fear of injury to the pulp. The inlay should be fitted to the cavity; then, with a fine-edged stone (wheel), a slight groove should be cut around the edges of it. Roughen the under side of the inlay also, if it is thick enough to warrant it. After the color of the porcelain selected for a case is decided on, do not be disappointed if, when it is ground, fitted, and cemented in the cavity, the cement changes it to a lighter or darker shade than the tooth. The cement should be one or two shades lighter than the inlay. I usually select several colors of the oxide of zinc and mix with water, placing the inlay in the cavity with this preparation until the proper color is obtained. It takes but a moment, and is easily removed. Then mix the oxide selected with phosphoric acid. It is often necessary to mix two powders together to obtain the color desired. Enamel of porcelain being translucent and zinc phosphate opaque, one's patience will be taxed sometimes to make nature and art harmonize.

In this model will be found a tooth in which there is a large cavity. As a result, the walls are not strong, one-third of the tooth at least having disappeared. The cavity being compound,—grinding surface and proximate,—to fill it with gold would be a tedious

operation. Amalgam would be very objectionable, and the non-metallic plastics would soon wear out. In such teeth I have for some years used a capping of gold plate with unusually gratifying results. Prepare the cavity as carefully as possible, leaving the edges of it strong and bevelled around the margins. Take a piece of pattern tin (25 gauge), and, after cutting it into shape, burnish it down, so as to restore the contour of the tooth. Remove this tin, and cut a duplicate in pure gold plate, same gauge; then beveling the edges of the gold, burnish it around the edges of the cavity. It is then ready for the anchor, which may be made of any stiff metal (I use 20-carat gold), and solder it on the inside of the cap with 14-carat solder, held over a spirit lamp. Fill the cavity with soft zinc phosphate, and press the cap in place.

We have here, gentlemen, the most satisfactory method for the restoration of such frail teeth that is known, in my opinion, embodying, as it does, the advantages of the non-metallic substance inside and the durable qualities of the metallic outside. Then, too, the patient is spared the ordeal of a tedious operation, and the operator's vital force and mental balance will not suffer. The tooth, too, will last longer than if a large amount of metal were placed in it.

I use pure gold because of its malleability, and the edges can be burnished so as to make it fit the cavity accurately. Be sure to bevel the edges of the cavity. Fine stones are best for this purpose.

Dr. Allan.—The case which Dr. Raymond has alluded to, and which I had the pleasure of seeing, was the most perfect piece of operative work in that line I have ever seen. I had had a prejudice for many years against this inlay work, deeming it in a great measure impracticable, but when this young lady presented herself and I examined those inlays I found them almost perfect, and they could not have been detected as being artificial without the closest examination. Dr. Raymond assures us that those inlays are perfect to-day, which does him great credit, and I know the work gave the greatest possible comfort to his patient.

I wish to call attention to one fact, and that is that while he does the work practically in an off-hand manner,—that is, he cuts out his piece of tooth and grinds it roughly to a plaster model and then finishes it so as to fit the cavity,—he does it with a rapidity and certainty that I doubt are equalled by any other practitioner. I think the process takes about two hours for the usual labial cavity, and I have used more than that time on a case, and had it a

total failure many a time. Dr. Raymond has placed several of these inlays in my mouth, and he did it in a business-like way,—that is to say, there was no lost time; and I have been complimented a great many times on the improved appearance of my dental organs.

The principle that he has so well demonstrated, of facing a large cavity with gold, the bulk of the filling being zinc phosphate, I think will appeal to the good judgment of all as being eminently practicable in this class of cases, saving an immense amount of energy and time. I have never practised it myself, and only judge of it by these models; but I do not see how the doctor could remove one of these facings in case there was necessity without destroying it. It seems to me that if provision were made in some way for removing the facings, it would be a very great addition to the usefulness of the operation.

Dr. Brockway.—Will Dr. Raymond inform us what cement he uses for these cases?

Dr. Raymond.—I have used almost every preparation on the market. Just now I am using a so-called German cement, sold by the Consolidated Company on Forty-second Street, N. Y.

The President.—How does Dr. Raymond prepare his porcelain inlays?

Dr. Raymond.—Some years ago I took about a pint—more or less—of porcelain teeth and broke them with a hammer. There being all shapes, sizes, and colors, I can generally select what is required from this collection. If anything special is needed, I select from the stock at the dental depots. I prefer the English teeth for many cases. They are harder to work into inlays, but they retain their color better after the cement is placed under them. By first cutting the tooth with cutting pliers one will save much grinding. Fitting these inlays is an excellent way for us to cultivate the grace of patience.

Dr. Davenport.—May we draw the conclusion from what Dr. Raymond says of the danger of changing the color of the porcelain inlay by the use of a cement of improper color that he might get the correct color by the use of the right cement even if the porcelain were not of the exact shade; in other words, whether the color of the finished operation did not depend quite as much upon the cement as upon the porcelain if the porcelain were translucent. Would not the English teeth be far superior to American, as in polishing down they take a much better surface than will American teeth after the enamel is ground off?

Dr. Raymond.—I find that after setting these inlays it is not necessary to polish the surface highly. As long as the surface is moist one cannot tell whether it is polished or not.

Dr. Kimball.—Dr. Raymond spoke of cutting the edges with a fine wheel. May I ask what he meant by that?

Dr. Raymond.—After the inlay is shaped to the cavity, I take a fine corundum wheel and make a little groove all around the edge of it. The cavity being dovetailed, the cement then holds the inlay in securely. I have seldom known one to come out.

Dr. George Evans.—Take an approximal cavity, which would consume about two hours to excavate, and fill with gold-foil. If Dr. Raymond would undertake to fill that cavity with porcelain and finish it as he explains, how long would it probably take him?

Dr. Raymond.—I never attempt to use porcelain inlays in approximal cavities, unless there is plenty of room. One cannot make a success of it except under very favorable circumstances.

The time required to place an inlay depends entirely on the conditions,—the size, position, and shape of the cavity. Having had considerable experience, I can work them in almost as rapidly as I can put in gold fillings. The question of dexterity is largely one of practice in this line of work.

Dr. Elliott.—I would say, in regard to the last subject, that the process of inlaying is carried on much more largely in England than here. Mr. Dall, of Scotland, prepared the extended apparatus alluded to; it is sold by Ash, but is largely confined to round and half-round cavities. To me it is altogether a new feature that English teeth are less translucent, because I have always understood that their teeth were the most translucent, and for that reason I preferred them. The difference in manufacture is that in the English goods the ingredients are ground together and then poured into the moulds, while the American teeth are made in a thick paste and forced into the mould; the result is that in the English teeth the particles are much finer than in the American. Dr. de Trey is an old Swiss friend of mine who has been experimenting with gold for twenty years. There are, of course, two kinds of gold; foil and precipitate, the main distinctive feature between the different precipitates of gold is the mode of manufacture. The de Trey gold, as I understand it, consists merely in so controlling the electric current that the deposit of crystals is exceedingly slow and fine, and the result is that you get a mass of crystal gold, not in the form of a mass which is to be subsequently cut up, but in the form of a sheet generally about an inch square, the sheet

being about as thick as ordinary blotting-paper, and the crystals are apparently deposited upon a sheet of this foil. Now it seems to me that the relative value of the precipitated gold is in its physical character. I think we would get much the same result that we do from de Trey's gold with any other sponge-gold that is prepared in the same way in thin sheets, were it not that the crystals of de Trey gold are so minute. After experimenting with this gold for some years, having imported, I believe, the first lot into this country, I now use it almost exclusively. Suffice it to say that, in my opinion, de Trey's gold is going to largely take the place of other forms of gold, and for this reason: for a given amount of force, one gets greater condensation. That is practically the secret of the whole thing. In order to test the matter I have made some experiments which I found very interesting. I made a detachable steel mould and filled it in different ways so that the result was a bar of gold. I then tested this for solidity by the specific gravity test. My impression has always been that, theoretically and mechanically, the best fillings were made by the solidification of parallel layers. Flat foil, when used with the hand-mallet gave me a specific gravity of 15 +, pure gold being 19 +. I used the de Trey gold, with a view of testing its use with the R. A. engine-mallet and a very small point. It gave a specific gravity of not over 9, it being too much chopped up. I then took the de Trey gold and put it in by hand-pressure; I got a specific gravity of 11 +. This morning I put in a filling of the same gold with the hand-mallet in the ordinary way, and it gave me a specific gravity of within a fraction of 17. The bar put in with a small point broke very readily, it having apparently no cohesive strength.¹

I have made a number of instruments to use with the de Trey gold, which all may wish to examine. There is nothing about them

¹ The bars used to test for specific gravity were afterwards broken with the following result:

Average of seven breaks, Watts's gold hand-mallet, five pounds, approximately.

Flat No. 4 globe-foil hand-mallet, sixteen pounds, approximately.

De Trey gold hand-pressure, seven pounds, approximately.

De Trey gold hand-mallet, four and a half pounds, approximately.

De Trey gold R. A. engine-mallet one and a half pounds, approximately.

All bars were the same size and were de Trey's $\frac{1}{1000}$ inch broad (over $\frac{1}{10}$) by $\frac{9}{1000}$ (a little over $\frac{1}{16}$) inch thick.

Result. For strength, flat foil is the best; for adaptation, facility, and density, de Trey's.

except that they have bulbous extremities. Operators should be cautious about one thing; in all cavities, in the use of this gold, direct pressure should be had in all directions. With the ordinary hand-pressure a specific gravity of 11 may be secured, which gives good surface hardness. With hand-pressure also, pressure in any direction can be gained, whereas with malleting, it is far more complicated.

The President.—I think that the committees have given us this evening a large repast, and I am sorry that time could not be given to discuss, for instance, the gold spoken of by Dr. Elliott. Dr. Elliott has not brought up the point of deepest interest,—namely, the adaptability of the gold, of which he speaks, to the edges and walls of cavities; he speaks of specific gravity, but that is only one quality, and not by any manner of means the most important. As long as Dr. Elliott has brought up the subject in the manner in which he has, showing his familiarity with it, I hope he will go a little further at one of our meetings in the fall, and bring to our attention other points, upon which he has not touched. He is probably better qualified to do so than any other one of us, and will bring out a discussion that may be of real importance to all.

Dr. Allan.—If this report of the Committee on Operative Dentistry could be continued at one of the fall meetings, this subject of the de Trey gold could be more fully brought up and discussed. I have a package of instruments here, but there is not time to exhibit them, and there are many points to bring out on this important subject.

There is another preparation of the crystal gold series just designed by the S. S. White Company, some of which I tried to get to show this evening, but I was unable to secure it.

The President.—I can only thank the committee for its earnest efforts to bring something before us of interest and importance, and I trust the Executive Committee will take into consideration what Dr. Allan has requested for the fall meeting, so far as is consistent with other arrangements. If I may allude to another thing, our friend from Plymouth, Dr. Shumway, showed us some experiments in regard to the cohesive qualities of gold, and in the course of those experiments he remarked that he gets absolutely solid gold in his cavities by wiping gold onto gold or tin with light ivory points. These are ideas worth bringing out by a self-constituted or other committee that shall experiment in that direction and find out the actual facts.

Dr. Allan.—Before moving to adjourn, I would suggest that the

Institute pass a vote of thanks to Dr. Woodward and Dr. Woodward's patient for their kindness in allowing us to see that beautiful piece of work. The patient has been put to much personal inconvenience and shows her interest in the subject in a graceful and kindly way.

Adjourned.

S. E. DAVENPORT, D.D.S., M.D.S.,
Editor The New York Institute of Stomatology.

ACADEMY OF STOMATOLOGY.

A REGULAR meeting of the Academy of Stomatology was held on Tuesday evening, March 22, 1898, at 1731 Chestnut Street, with the President, Professor Edwin T. Darby, in the chair.

A paper on "Restoration with Porcelain in Fracture of the Teeth" was read by Dr. Foster Jack.

(For Dr. Jack's paper, see page 493.)

At the close of the reading of Dr. Foster Jack's paper he stated that if he failed to elucidate certain parts in his discourse to the satisfaction of the members of the Society, it would give him pleasure to answer such queries as they might propound, when the following informal questioning took place:

Dr. Huey.—Would it not be almost impossible to preserve the pulp intact if a tooth were broken to any great extent as in such a cavity as is shown in Fig. 4?

Dr. Foster Jack.—No. The tooth that is broken is generally a thin tooth at the incisal edge, and the pulp does not extend far down. In a young tooth it might, but in the case cited it did not. The illustration is taken from a case in actual practice. The patient was about twelve years old.

Dr. James Truman.—I wish to thank Dr. Foster Jack for bringing this important subject before us. I regard it as a most important advance in dentistry and, as presented, quite original. I would inquire if Dr. Jack has tested the pins and porcelain in actual practice to know whether they are of sufficient strength? I would also like to ask how the piece is cemented to place?

Dr. Foster Jack.—The pins are of iridiumized platinum, and are sufficiently strong, and the pins can only be dislodged by the breaking of the tooth. As to the attachment, I cut both surfaces slightly concave. That gives a better and finer line. The porcelain corners

are sufficiently strong to withstand mastication. The only danger lies in malocclusion from the lower tooth. That would sever the porcelain, but not at the point of union of the retaining porcelain with the contour portion.

Dr. Gaskill.—How do you fasten the two pieces of porcelain together?

Dr. Foster Jack.—After relating the retaining and contour porcelains with wax and trying in, they come away together. Trace around the edge of the retaining porcelain with a pencil, remove the wax and substitute a thin porcelain body, replace it in the furnace, and fuse it. The wet porcelain body holds the two portions together sufficiently to allow of a moderate amount of handling. The pieces fuse together perfectly within five minutes, and the piece is as strong at the union as at any other portion.

Dr. Darby.—This is a very interesting subject, and I am sure it will call forth some discussion. Dr. McQuillen has had experience with porcelain; he saw Dr. Jenkins, of Dresden, work it last summer.

DISCUSSION.

Dr. McQuillen.—I, unfortunately, am not skilled in the use of porcelain, but did have a great deal of pleasure from seeing Dr. Jenkins use it. He has been very successful in obtaining colors, and his method is entirely different from that shown to-night. He bakes his inlay in an impression of the cavity, and moulds up the body for a corner. He has made some wonderful and beautiful restorations, and, I believe, with almost unvarying success. His method is simply this: After preparing the cavity, he takes an impression with No. 20 or 30 gold, which he packs into the cavity with cotton, and then that is drawn out very carefully, invested in asbestos in a little platinum cup, and filled with the body. He has, I suppose, certainly fourteen or fifteen different shades that he has been able to get, and by experience he knows which one to use. After three bakings they are ready. Though these bodies are of a low fusing variety, they are not porous when fused. I remember one case of Dr. O'Brien's which included more than a third of a central incisor, and at a very slight distance it was impossible of detection.

Dr. Darby.—Dr. Jenkins has a little muffle made of Russia sheet-iron put on a standard and lined with asbestos. Under this little hood there is an opening, and below this a blow-pipe operated by a bellows, which throws a hot flame. Then, in a little platinum dish that has a handle, the inlay is carried into the muffle and

heated up. The lining of the asbestos there retains the heat, and you get it directly on the little cap that holds the porcelain. This porcelain is in powder form and is mixed with absolute alcohol; it requires as much heat to fuse this body as it does to solder a gold plate,—almost a white heat. After baking, the body has shrunk into one corner of the impression; more is put in, and that shrinks also, so you have not your mould full. It takes about three bakings to bring it up to the desired contour, and it is important to get just body enough to be certain of a good joint at the cavity margins. Dr. Jenkins has done it so often that he almost never fails. I tried a good deal out of the mouth before I did it in. I made more failures than successes. I have put some in the mouth; probably three or four have been exceedingly satisfactory. In one or two cases I had to fit the occlusion. On masticating surfaces I have had some very excellent results.

The one thing that is lacking is a variety of shades. Dr. Jenkins expects to have about twenty shades, so that anything can be matched.

As Dr. McQuillen has stated, the operations were very beautiful, and at twelve inches from the patient's face you would hardly recognize that it was porcelain and not tooth-substance. I saw yesterday two porcelain inlays that Dr. O'Brien, Dr. Jenkins's associate, put in about two years ago, and the line of demarcation between the tooth and porcelain was so exact that even now, after two years time, one would say it was an exceedingly satisfactory operation. These fillings can be polished after grinding.

Dr. Inglis.—I wish to express my appreciation of the paper Dr. Jack has given us this evening. It is simply a revelation in its line to me. I have used porcelain considerably, but the ideas presented are nearly all new. I have always avoided the use of bodies which would fuse in gold, because they have been said to disintegrate in the mouth.

With regard to making the different shades, that matter is quite simple. The Wilmington Company furnished for Dr. Land a certain line of shades. One was the color of the natural gum, and five were of decided colors suited to porcelain work and continuous gum. By taking these five shades, and mixing them in various proportions, any shade can be obtained except very dark ones, and these are not ordinarily needed. These shades are yellow, white, blue, gray, and brown. I take one-half of No. 1 and one-half of No. 4; that makes a certain shade. Then I take one-fourth of No. 1 and three-fourths of No. 4; that gives me another shade; and so

on. It is not necessary to keep mixtures on hand, but merely to bake a sample, which should be perforated and numbered before baking, and when it comes out from the furnace the numbers are indelibly fixed. These samples are strung on a wire. When you have a case in hand, take the shade, ring, match the tooth, and refer to the record for the proportions corresponding to the number of the shade. In order to mix bodies of different colors, one body should be freely wet with water and the other body thoroughly mixed in. The excess of water is readily absorbed with a blotter.

Dr. McQuillen.—I would like to say that Dr. Jenkins showed me two cases one day, one that had been in service five years in the upper cuspid on the disto-lingual surface, and there had been no disintegration. He told me it was a body with which he was not satisfied, because he found it slightly porous, and that what he was then trying to do was to make a body that would not be porous. There was another in the mouth of an Austrian general that had been in four years, and it seems to me that if porcelain will not show any disintegration in four years, it is a pretty safe thing to use.

Dr. Inglis.—Dr. Moffet told me that he was unable to get low fusing porcelain that would not disintegrate in the mouth, his experience having been obtained in continuous gum pieces. So I avoided its use, as I had the Land body, which was perfectly satisfactory, can be manipulated as rapidly, and is far more natural in appearance than any glass I have met with. I use that instead.

Dr. Darby.—It makes a great deal of difference whether this gold is backed up by asbestos investment. If you take a piece of pure gold and hold it over a flame of your blow-pipe, you will melt it; but it will stand a great deal more heat if it is covered up. The investment is in a little porcelain cap filled with pulverized asbestos and water.

Dr. Foster Jack.—I wish to lay stress upon the beauty of this kind of work. The pieces are cut from tooth-crowns, and it is surprising how closely one can fit a piece to a fractured tooth. None of the specimens have been touched on the outside, with the exception of the completed one. They fit nearly perfectly before you have to do any grinding on the outer surface. In the class of cases illustrated in Fig. 1, one can sometimes fit the labial surface perfectly without any reduction and without destroying the original gloss of the porcelain. I prefer the Ash crown for this work. Some of the other crowns—the old-fashioned pivot-crowns—are very good. They are sometimes better, but you cannot grind them.

Dr. Huey.—We have all found the Richmond solid gold crown to be unsightly in certain exposed positions. Still, it has some good characteristics. It occurred to me that a combination of the Richmond crown with porcelain would be a good one, so I devised one. Suppose that we have a bicuspid tooth with part or all of the lingual lobe remaining. This is suitably prepared to receive the crown. I then make a band of an alloy composed of twenty-two and a half parts of pure gold and one and a half parts of platinum. That is an alloy that fuses at a very much higher temperature than pure gold. I make a lap-joint and solder with pure gold. The band being accurately fitted to the tooth and allowed to extend the entire length of the intended crown, I then cut out a large part of the inciso-labial portion of the band, and between the lips formed by its mesial and distal sides I fit one of the Ash diatoric bicuspids. The tooth sets down into the band. I mix a little Timme body with water, and put a layer on the outside and inside of the band, insert the porcelain tooth, and fuse the body. If I have not here enough anchorage in the body of the tooth, I put a screw into the root, and allow it to extend up into the dovetail opening in the tooth. The cement goes all around that and holds securely. The Ash tooth is pretty strong on the grinding surface and is easily articulated, and as it is anchored on a solid bed of Harvard cement, there is nothing to give way. I have never yet had one to split. This method of crowning a bicuspid exposed to view is more satisfactory to me than any other. I can make one in an hour and a half.

Dr. Broomell.—It appears to me that it is not necessary to drill so far into the porcelain tips for anchorage of the pins as Dr. Jack has done. A simple covering of the head of a vulcanite pin has proved satisfactory in my hands in cases similar to these.

In a case in which the entire labial surface of an inferior incisor had been split off and the lingual portion of the crown left standing, I truncated the incisal edge and reduced the remainder to a thin wedge shape. I then made a gold cap to fit the stump of the crown, and to this fitted a cross-pin tooth in such a manner as to permit the pins to project lingually over the thin incisal edge of the cap. The tooth was then backed, related to the cap, and the piece invested and soldered.

Adjourned.

OTTO E. INGLIS,
Editor Academy of Stomatology.

Editorial.

THE TENDENCY TO LEAN ON THE PAST.

CONSERVATISM is an excellent brake in the chariot of progress, and serves as a regulator in all the relations of life, but a dependence upon it is as injurious as the hasty advance from old things to new without due consideration.

The progress of dentistry has not been checked, in any large degree, by precedent. The profession is entirely too new to have the old lines so well marked that any overstepping leads to criticism. While this is true there is a tendency to regard innovations with something of the prejudice characteristic of established custom which has so marked all the various phases of human endeavor.

The time has been when dentistry was a law unto itself. It absorbed, both in its theoretical and practical, all possible from older thoughts and practice, and that without much regard to methods adopted in the schools or in the laboratories. It has also marked out for itself an honorable share of original research; in fact, it is to that it owes its present position as one of the very important factors of modern civilization.

The fifty years of experience has led by slow degrees to a broader curriculum in all the dental schools, and now, in the last days of the century, these stand, as a rule, fully abreast with that of medicine.

With this advance of the standard of training there has been developed a tendency to lean upon the past and allow the mind to rest satisfied with the conclusion that there is nothing more to be gained not already known. This is the insidious poison that has weakened not only professions but peoples.

It requires but a slight familiarity with the nationalities of Europe to perceive that there is in everything there a continued and close adherence to precedent. The marked contrast between the rapid progress in this country, as compared with the slower evolutions there, has been noticed and commented upon, but the lessons taught in the war at present upon us should not be lost in this direction. The United States government marked out for itself its own course of procedure in both arms of the national

service, which, as it failed to follow European ideas, was met, as we know, by the contemptuous criticism of all military and naval experts. The result has fully justified the departure from established usage, yet, while it has silenced criticism, it is not probable it will change the methods of foreign countries. These are fixed, and it will require something more than the present war to change them. It remains, however, one of the most valuable object-lessons, and serves to illustrate the necessity of freedom in thought and practice, if progress in any direction is to be maintained.

It has frequently been expressed upon these pages that law within certain limits is not only necessary but valuable as a mental stimulus to correct thinking, but, carried beyond healthy bounds, becomes a weakening force, tending to a dependence upon power, and landing nations into the conservative quicksands from which there is no escape. All people necessarily retrograde slowly but surely as they come to depend upon law and the mediocrity in thought which it engenders. When freedom of thought and action has ceased in America, as at present in Europe, through conservative influences, that will mark the period of its decadence.

This truth, as applied to nations, is more forcibly pronounced when considered in connection with professions. Here the conservative element is ever in the ascendant and becomes a continual bar to progress. The natural tendency of professional education is to confirm this feeling in the younger element, and it is feared will have a retarding influence in the near future. It has learned too much to depend on authority, and the dictum of the college hall will remain with them as the standard for many years to come. This is one of the injurious effects of high training, and should be met by radical treatment during the undergraduate period. The imperative need of the hour is to combat this inertia by instilling into the students of our dental colleges an enthusiasm for original investigations in all lines of our work. This is not difficult of accomplishment if the teacher is earnestly interested. His enthusiasm will soon strike a responsive chord in many minds. To meet this properly there must be less of didactic teaching in our colleges and more direct contact with the pupil by the teacher. It is not probable that the former method will be dispensed with, as there is no better way to instil principles, but the magnetism of direct contact must be more generally introduced if the dental profession is to continue the progressive body it has been in the past.

The world needs to get away from the idea that what is good enough for us is sufficient for our children. Every generation

needs something better than the preceding. Perfection has never been reached in any direction, and it is safe to assume will not at any time in the future history of civilization.

There was a painful illustration of the tendency to lean upon the past when the new national organization was completed at Old Point Comfort. Before this reaches our readers this body will have met and will, probably, continue upon the old lines. Conservatism conquered, and the effect, it is feared, will be disastrous to all true progress. We need new life, new measures, new men, if we are to reach out and grasp the embryo thoughts of the coming time. The crutches of the past must be thrown aside and dentistry must walk erect in its own paths. If any change be made in the next few years in the machinery of our work, it is hoped a careful consideration will be given to the needs of the present, with a due regard to the possible wants of the future.

The organization of societies should be based upon this view. Constitutions of fifty years ago should be permitted to lie in the literary mausoleums of the past. Let the new wine be placed in new bottles labelled for use in the generation producing it. Constitutions based on immutable principles can never change, but many, like old creeds, need constant revivifying to keep pace with the ever-growing thought of the time. There is such a thing as the antique in the formulation of the moral code, but there can never be antiquity in the essentials of ethics. We change the form of our dress, but the basic principle of clothing the human body has remained the same since man covered himself with skins.

Whatever moral force the conservative element in human nature possesses, it must not be permitted to shackle progress, and by progress is not meant change for the sake of change, but that thought should be rehabilitated to new conditions.

The old standards are giving way before greater enlightenment, and they are wise who rise up to meet these changes, not in an antagonizing spirit, but with the glad thought that every step made means one degree nearer civilization and one remove from the barbarism of prehistoric man.

Bibliography.

ORAL PATHOLOGY AND PRACTICE. A Text-Book for the Use of Students in Dental Colleges and a Hand-Book for Dental Practitioners. By W. C. Barrett, M.D., D.D.S., M.D.S., Professor of Oral Pathology in the University of Buffalo, Medical Department, etc. Published by the S. S. White Dental Manufacturing Company, 1898.

This volume, prepared by one of the best-known and clearest thinkers in the dental profession of the United States, will command wide attention. Whether this will be in agreement or otherwise, the book will fill a place among the text-books of college work. It is true, as the author states in his preface, that books upon dental pathology issued prior to the present year were not well adapted for "students in colleges as every day manuals for those who sought help in the hourly recurring complications of office life, they were too voluminous." In some instances, it may be added, they were too limited in scope. The author has aimed to strike a medium between these two extremes, and furnish the student with a compact volume of moderate price and not difficult to handle.

In view of this intention of the author, the book cannot be reviewed with the same attention to details as would be necessary in a work of greater magnitude. This volume, including index, makes a book of 239 pages.

The one peculiarity of this book, in which it differs from all others and which gives it a unique character, is the typography in which the prominent idea is sought to be conveyed. This is attempted to be impressed forcibly upon the mind of the student by heavy-faced type at the beginning of each distinct paragraph. This, while valuable to the untrained mind, becomes rather trying to one familiar with the subject, and it may be questioned whether it will aid materially the individuals for whom it is especially intended.

The author includes in his fifteen chapters some pathological conditions not usually incorporated in books upon dental pathology, such as pharyngitis, tonsillitis, diseases of the tongue, etc., entertaining the idea of "making of oral practice a true specialty of medicine." While this effort to broaden dental thought and practice has much to commend it, there still remains the question

whether it is proper to transcend certain boundary lines and invade those of other specialties.

Chapters one to ten cover much valuable material, prepared with care, and briefly but thoroughly summarizing all the topics included under bacteriology: classification, fermentation, bacteriological pathology, septic and aseptic conditions, and inflammation, the latter covering five chapters.

The author's idea of proper teaching, as laid down under inflammation, is unquestionably the true one, that "it is infinitely better that the student in college should be given but one hypothesis rather than a number of conflicting theories," but as long as we have many men of many minds, this much-desired condition can never be reached. It is, however, one of the most troublesome features in teaching a professional subject. The writer has always contended that, upon practical lines, one system should alone be taught, but this fails the moment it comes in contact with the diversity of opinions in teaching force.

The chapter on "Diseases of Dentition" contains some very peculiar ideas, coming, as they do, from a dental practitioner. The prominent thought is expressed in the opening paragraph, "That it is possible for a retarded or disturbed dental development to induce very serious derangement is indisputable, but that it is a principal factor in inducing the great number of deaths that occur in children can scarcely be maintained. There are many cogent reasons for the contrary belief, while there is nothing, save the mere fact of coincidence, to sustain the theory too commonly accepted without inquiry or consideration." The author then follows with extended statistics of mortality in various foreign countries, and concludes that "nowhere is the cutting of teeth statistically given as the direct cause of mortality. Although it may in some instances induce death through some other complication, its influence is too insignificant to be included as a separate cause." It is surprising that the author should be willing to accept these statistics upon their face value when he must know that they are misleading, for it is a well-known fact that outside of dentistry dentition is not generally recognized as a possibly distinct pathological condition, in fact, is entirely set aside as a prominent factor in diseases of childhood by all except the most advanced thinkers in medical circles. Dentists who have accepted the opposite view through "inquiry and consideration" and, it may be added, extended experience, will regard the position taken by the author with regret. That his conclusions are wrong from the stand-point of the reviewer is

certain, and they are certainly out of harmony with the ideas entertained by the leading thought of the dental profession.

It is not surprising, therefore, to find in the chapter upon the "Treatment of the so-called Diseases of Dentition," some very peculiar advice, especially in that where the appearance of the gum is to be the indicator for the use of the lance. While this is frequently a very sure guide, it is equally certain that reflex disturbance will occur at very early stages of development through pressure upon the pulps at the undeveloped portion of the roots, and this without any external evidence.

The reviewer has failed to find a single line upon the possible lesions of the permanent dentition. This is, to his mind, an extraordinary omission, when it is recognized as productive of some of the most serious pathological conditions. The first, second, and third molars have each their peculiar difficulties. The second especially through its development in the ramus of the inferior maxilla, and the third with its serious complications during the process of eruption.

The two chapters devoted to the pulp will, it is presumed, not meet the views of the large majority. The subject is practically limited to pulpitis and its treatment, which is too narrow even for the limitations the author placed upon his pen. The practical student will search in vain for any advice upon superficial pulpitis, pulp gangrene, pulp mummification or antiseptic precautions relating thereto.

The average dentist will be rather startled at this advice given under the treatment of alveolar abscess. "Warm fomentations may be used, a cloth rung out in hot water being applied to the face over the seat of trouble, and carefully covered, while the patient is kept warm." This certainly antagonizes all the teaching in this direction since the reviewer entered the dental profession. The fact that warm applications, at the place indicated, tend to produce a tissue of lessened resistance and invites the production of an external fistula seems conclusive to the writer. The advice given is not only contrary to established usage, but is wrong in fact, and will certainly lead the untrained into a maze of difficulties.

In considering "Deposits upon the Teeth," the author says that "the so-called 'green stain' of childhood is wholly superficial. It is called 'green stain,' although it may be dark or bronze or yellow in color." The colors here are somewhat mixed, for green stain has never before been combined with the yellow deposits. He further states that "it has then no special pathological signification,

except so far as it may be a symptom of some unhealthy condition of the fluids of the oral cavity." That it leaves the enamel "un-eroded" is not the experience of the writer.

The chapter on "Pyorrhœa Alveolaris," and especially the treatment, is not, in the reviewer's estimation, very satisfactory, and the author's statement that "very little dependence can be placed upon the many specific methods and remedies offered by those who claim to cure the incurable," must be regarded as unwarranted in view of the many positive statements made by individuals thoroughly versed in theory and practice. That pyorrhœa can be permanently cured admits of no question, and to assert that it is "incurable" is simply denying well-attested facts.

The author apparently has but little faith in cataphoresis in the treatment of hypersensitivity of dentine, for he says, "While, therefore, every progressive operator should use it, it is not now to be considered a finality. Its application must be simplified and its effects made positive by further experimentation before it can be so accepted."

The author ascribes the formation of nodular deposits to odontoblasts, for he says, "The former (odontoblasts) may exist enveloped in the pulp-tissue, and under the special stimulus that was perhaps responsible for their formation may commence functional activity, with the consequent organization of segregated spicules of dentine, and these may continue to grow until they assume the form of the usual pulp nodule." Upon what ground this hypothesis is entertained does not appear, and as it is not in accord with the generally accepted view of the origin of these calcific deposits some reason should have been given for the statement. A wide distinction must be made between secondary dentine and the deposits in the pulp. The odontoblastic layer has all to do with the development of the former, but, apparently, has no relation with the latter.

It is unnecessary to follow the author through the remaining chapters. They as well as all those preceding are written with the author's usual ability and terseness of style.

The differences which naturally arise between reviewer and author are more the result of different experiences, and do not necessarily involve the general character of the book. This one will occupy a place in the text-book series not exactly filled by any previous work. The idea generally entertained of a text-book is that it must be absolutely in accord with accepted opinions. This, in the writer's opinion, is an error, for the fact that the volume presents the personal views of the author gives it a special

value not to be accorded to a book prepared through compilation. It undoubtedly will find a place among the recognized works used in dental college instruction.

CATAPHORESIS OR ELECTRIC MEDICAMENTAL DIFFUSION AS APPLIED IN MEDICINE, SURGERY, AND DENTISTRY. By William James Morton, M.D., Professor of Diseases of the Mind and Nervous System and Electro-Therapeutics in the New York Post-Graduate Medical School and Hospital, etc. New York: American Technical Book Co., 45 Vesey Street, 1898.

The author says of this book that "this treatise has been written at the request of some of my friends, earnest practitioners in medicine and dentistry, particularly the latter profession, who desire information, not alone in regard to the mere practice of the art of electric diffusion, but also in the fundamental principles which govern this art."

Cataphoresis has had such a rapid development that it is not surprising to find the able author and one of the practical originators giving to the medical and particularly the dental profession a work which will remain as an authority upon this subject.

The author begins his book with the history of the subject,—a valuable contribution to our knowledge in this direction. In the chapter upon its "Developments in Dental Surgery" the author does full justice to the earlier experimentation, and will thus set at rest disputes in regard to priority.

The "Writer's Contributions" constitutes an interesting chapter, and exhibits a thoroughness in every step taken worthy the highest commendation. As an illustration of this the following quotation is given, in which he attempted to prove the ease with which "solid particles might be driven into tissue by the action of the electric current. Some finely powdered lamp-black or graphite was incorporated with some salicylate of soda and placed on my arm under the positive electrode. The current was turned on and the particles of graphite were carried into the sweat-follicles, making small black spots, like bird-shot, which were so deeply embedded that they did not disappear for several weeks."

The chapter on "Elementary Electrical Principles" will be of great value to those who are beginning the practice of cataphoresis without the necessary knowledge of electricity. The elementary principles are so clearly elucidated that the unlearned will find the subject so simplified as to be easy of comprehension. The importance of this cannot be over-estimated, for many have rushed into

the use of this method without any definite idea of the meaning of the words volt, ohm, ampère, coulomb, watt, or joule, or of the possible injurious effect which may be produced through ignorance.

The chapters on electrodes, both medical and dental, are fully illustrated and very suggestive.

Upon the "Anæsthetization of Sensitive Dentine" the author is careful in his directions in order to avoid accidents, and directs "not to break the circuit . . . by removing the electrode from the tooth with the current turned on, . . . and not to leave the patient during the administration, as an accident may occur by the patient interfering with the electrodes. . . . It is well to insulate the chair by placing linoleum or rubber under its feet." It is doubtful whether these precautions are taken by the majority of operators.

The author maintains that "the best results are to be obtained either from a strong solution of hydrochlorate of cocaine or a solution of hydrochlorate of cocaine with guaiacol, which I was the first to propose. . . . My preference is for the guaiacol-cocaine, principally because of its greater rapidity of action, its sterilizing effect, and its reduction of the chances of toxic effects from cocaine by preventing its diffusion to the general circulation."

The chapter on "Bleaching of Teeth by Cataphoresis" is interesting and practical, and is fully illustrated by experiments out of the mouth as well as by cases in actual practice. The value of this process is now so generally recognized that, whatever may be the final outcome of cataphoresis, this part of it, without doubt, will remain as a permanent method of practice.

While it is not possible as yet to determine the full value of this treatment in its relation to sensitive dentine and to the pulp, sufficient has been proved to demonstrate its importance, and those who make use of it should be thoroughly informed in the *minutiae* of procedures necessary to produce satisfactory results. The fear, not by any means exaggerated, that eventually disastrous results would follow the use of this process has thus far not been confirmed. It is true that the few cases reported of death of the pulp tend to enforce the necessity of caution and greater knowledge of the agents used. There is evidently less enthusiasm regarding cataphoresis than was manifested at its earlier introduction, but that it will become a useful aid in the practice of certain lines of dentistry cannot, with our present experience, be disputed, and the practitioner will not require a better or safer guide than this volume of two hundred and sixty-seven pages. It should become a text-book upon this subject in all the dental colleges of the country,

for the demands of the future will require thorough teaching in this direction. For the practitioner it cannot fail to be of constant value in his daily operations.

Obituary.

DR. WILLIAM PEPPER.

DR. WILLIAM PEPPER died July 28, 1898, of heart-disease, at the residence of Mrs. Phœbe Hearst, Pleasanton, California.

Dr. Pepper made this western trip on account of failing health, but neither family, friends, or professional advisers anticipated this early closing of his active life.

Dr. Pepper's father graduated with first honors at Princeton in the class of 1810, and became distinguished as the professor of the Theory and Practice of Medicine in the University of Pennsylvania. The son graduated from the Collegiate Department of this university in 1862, and subsequently from the Medical Department.

He became connected with the teaching department of his Alma Mater in 1868, and for two years thereafter was a lecturer on morbid anatomy before the medical classes. He was then transferred to the Department of Clinical Medicine, and, after six years as lecturer on that subject, was elected to the full professorship, and held the chair until 1884. In the last named year he succeeded Dr. Alfred Stillé as professor of the Theory and Practice of Medicine, a chair which he held down to the time of his death.

Meanwhile, in January, 1881, Dr. Pepper was unanimously elected provost of the university, in which office he succeeded Dr. Charles J. Stillé. This responsible position he filled for thirteen years, retiring from it in June, 1894. Under his administration the growth of the university was more marked than at any previous period in its history. Dr. Pepper was a man of extraordinary executive ability, of restless activity, and of the broadest, most liberal, and most comprehensive views on the general subject of education. Having inherited a large fortune, he was enabled to enforce his progressive ideas by liberal donations to the institution in whose welfare he took such an earnest interest and such an active part. His most important work, perhaps, in the development of the university was that accomplished by him in the direction of higher medical

education. This advance was secured through the extension of the course to four years, and was stimulated by the following proposition, which he made in 1891 :

"Being impressed with the urgent importance of higher medical education, and believing that it is the duty and the privilege of the Medical Department of the University of Pennsylvania to be the leader in this the final reform of medical education in America, I beg to submit the following proposition: That on condition the university shall decide and announce before June 1, 1891, that a four-year obligatory graded course of medical study shall be established on or before September 1, 1891, I will subscribe towards a permanent endowment fund of \$250,000; for the Medical Department the sum of \$50,000, subject to the conditions below recited; and towards a guarantee fund of \$20,000 per annum for five years, the sum of \$1000 annually during that period."

The report which Dr. Pepper submitted to the board of trustees at the close of his administration as provost, and covering the period of the thirteen years of its continuance, gave a clear idea of the growth of the institution. This report presented the following comparative figures :

	1881.	1894.
Land	15 acres.	52 acres.
Number of students	991	2180
Fees of students	\$92,701	\$230,567

The report further showed that during Dr. Pepper's term as provost the following departments were created: The Wharton School, Veterinary School and Hospital, the Biological School, the Graduate Department, Department for Women, the Department of Physical Education, the Department of Archæology, and the Laboratories of Hygiene and of Chemistry. The medical school course had been extended to four years, and those of the dental and law to three each, elective and technical courses had been developed in the college, and important auxiliaries, such as the Lecture Association, the Archæological Association, and the American Society for University Extension created. The growth of the University Hospital during the same period was also very great, culminating, as it did, in the erection of the D. Haynes Agnew Memorial wing, the Maternity Hospital, and the William Pepper Laboratory of Clinical Medicine, Provost Pepper's own memorial to his father.

In addition to his duties at the university and with the practice of his profession Dr. Pepper has regularly continued his literary

work. He founded the *Medical Times*, and was its editor in 1870-71. His most important literary work has been the editing of the "System of Medicine by American Authors" (five volumes, Philadelphia, 1885-86). This secured an immediate success, and was recognized as the chief American authority on medical questions. He published, in conjunction with Dr. John F. Meigs, successive editions of their work on "Diseases of Children" (1870). He was also a frequent contributor to the leading medical journals and the transactions of the medical societies. Among other publications from his pen have been his inaugural address and annual reports as provost, and public addresses on "Force vs. Work" (Baltimore, 1884), and "Benjamin Franklin" (Lancaster, 1887).

He was medical director of the Centennial Exhibition in 1876, and for his services therewith received from the king of Sweden the decoration of the Knight Commander of the Order of St. Olaf.

He was a member of the various learned societies of Philadelphia, and was elected president of the first Pan-American Medical Congress, held at Washington in 1893. In 1881 he received the degree of LL.D. from Lafayette College, and the same honor from Princeton in 1888. He was the principal originator of the Commercial Museums of Philadelphia, and subsequently became president of this important and justly celebrated enterprise. It was mainly through his efforts that the Free Library of Philadelphia was established upon such a broad, liberal basis that it is made available throughout the entire city.

His work as provost of the University of Pennsylvania exhibits, perhaps, more completely the character of the man, and will, doubtless, bring to him the most enduring honor. Its marvellous growth has been previously outlined, but figures can never tell of the exhausting labor given by him to effect the results stated. His aim was not to fill the grounds with buildings, important as he regarded these, for his conception of a university existed not in stone, bricks, and mortar, but in men, and therefore it was his ambition to have these structures occupied with the highest possible culture attainable. The result was soon manifest in every department, and the commanding position attained by the university under his leadership will be continued by his successor, Provost Harrison.

His interest in the Department of Dentistry never lessened. He once stated to the writer that in his earlier years he felt a strong prejudice against dentistry, which had entirely been removed through a closer intercourse with men connected with it and an increased knowledge of its value.

To the writer he was not only his superior in office, but a personal friend, ever ready to aid in any movement for the improvement of the Department of Dentistry, and to his earnest co-operation must be ascribed the large measure of success achieved.

While Dr. Pepper's fame will rest mainly upon his medical work, dentistry will ever remain indebted to him for his cordial co-operation in the efforts put forth to raise its standard. He was closely in touch with the National Association of Dental Faculties, and at once had it recognized by the authorities of the university and its regulations accepted as the guide for the Department of Dentistry.

To the writer his death leaves a vacancy among the list of those he honored, and the world seems all the more lonely that this active, brilliant mind is no longer a worker in it. While the majority of men labor to exalt their individual ambitions, Dr. Pepper unselfishly toiled to raise the standard of happiness, to increase human knowledge, and to leave the world better than he found it. Who will deny him the honor of having more than accomplished his ambitions?

In 1873, Dr. Pepper was married to Miss Florence Sergeant Perry, a granddaughter of Commodore Oliver Hazard Perry, and a lineal descendant of Benjamin Franklin. Four sons were born to Dr. and Mrs. Pepper, three of whom survive. These are Dr. William Pepper, Jr., who has been assisting his father; B. Franklin Pepper, a private in Battery A; and Oliver Hazard Perry Pepper, still at school.

DR. ALFRED P. SOUTHWICK.

DR. SOUTHWICK died at his residence in the city of Buffalo, New York, June 11, 1898.

He was born in Ashtabula, Ohio, in 1826.

In early manhood he removed to the city of Buffalo, and became a steamboat engineer, and in 1855 was chosen chief engineer of the Western Transit Company. In 1862 he commenced the practice of dentistry, after some five years' preliminary training.

He was one of the organizers of the State Dental Society in 1868, and for twenty years was a member of the State Examining Board. He was one of the founders of the Dental Department of the University of Buffalo, and in this he has been an efficient co-

worker with his colleagues, his personal influence and ability having had much to do with the success attained by this college.

Dr. Southwick possessed a marked independence of character, which, combined with sterling honesty, raised him above the motives that influence the actions of many men. True to his own convictions of duty, he secured the respect of his professional associates.

His death will leave a vacant place difficult to fill, not alone in his immediate circle, but in that larger field of work where the influence of such men is needed more and more as the dental profession advances towards higher things.

Notes and Comments.¹

EMPHYEMA OF THE ANTRUM IN AN INFANT.—Dr. Alexander Douglas reports, in the *Australasian Medical Gazette*, Sydney, New South Wales, a case of empyema of the maxillary sinus in an infant of only three weeks. He was called to see the child who was reported to be suffering from an inflamed eye. On examination, the face presented an unusual and striking appearance; the right cheek was swollen, the right eyeball protruded, the eyelids were hyperæmic, and the conjunctiva congested. The extreme protrusion of the eye suggested a growth of some nature at the back of the orbit. On looking into the mouth he observed that on the right side the roof was bulging into the cavity of the mouth. The superior maxillary bone was prominent in every direction. Pressure over the cheek caused pus to exude from the right nostril. The diagnosis was "empyema of the antrum."

An opening was made inside the mouth external to the alveolus, and pus flowed freely. Subsequently the cavity was washed out by syringing through the opening in the mouth with boracic lotion, free egress being afforded through the opening into the nose.

The case did well. The threatened bursting of the abscess into the region of the orbit was averted by the free drainage; the dis-

¹ The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 1338 Walnut Street, Philadelphia.

tortion of the right side of the face gradually disappeared, and the right eye has practically returned to the normal level.

DESECRATORS OF THE GRAVE.—*The British Journal of Dental Science* calls the late Dr. Thomas W. Evans the "Pecksniff of the European courts." The only comprehensible thing in its editorial of post-mortuary detraction is that it is characteristic. What there was of resemblance in Dr. Evans to that type of English hypocrisy, Pecksniff, it is hard to conceive. He was certainly an entirely reputable man and dentist, and he reflected honor upon dentistry as a profession. Our specialty has a higher status in every country upon the face of the globe, because Dr. Evans lived and practised. This should have protected his memory from the ghoulis attacks of any dental journal, even though Dr. Evans was a successful man and an American, two almost unpardonable crimes in the minds of many foreigners.—*Dental Practitioner*.

ARTISTIC ENVIRONMENT FOR THE DENTIST.—In a very interesting and instructive interview in the *Items of Interest*, Dr. J. Leon Williams says of the dentist's surroundings, "A dentist's work is, or should be, largely of an artistic nature. It is the direct product of his mind and hand. He should therefore surround himself, so far as is possible, with an environment which tends to foster and cultivate his sense of the æsthetic, not alone for the powerful direct effect of his surroundings upon his work (this is probably the less important influence), but because the constant effect of his surroundings upon his subconscious mind is like the accumulation of force in a storage battery. And it is from this reserve force, so to say, that the impulses for most of our actions proceed. This is not sentiment, but the newest science.

METHODS OF DISTINGUISHING EUCAINE FROM COCAINE.—The excessive solubility of hydrochlorate of cocaine permits its being distinguished from hydrochlorate of eucaine, for eucaine is soluble one part in nine of water, while cocaine is soluble in less than its own weight of water. To detect eucaine that may be fraudulently added to cocaine, because of its costing less, Vulpius states that by dissolving ten grains of the suspected salt in fifty cubic centimetres of water, and then adding two drops of aqua ammonia, if the cocaine

is free from eucaïne the liquid will remain clear, even though a few crystals may be deposited, whilst if eucaïne is present the solution becomes cloudy or milky in appearance.—*L'Odontologique*.

HOW TO MAKE ONE'S SELF UNPOPULAR.—In writing upon the subject, Dr. T. B. Welch, in *Dental Brief*, says, "If you would be unpopular make frequent mention of your troubles and pains and misfortunes. Speak of your losses and crosses, how people misrepresent and wrong you, abuse and misuse you, misjudge and misunderstand you. Make everything appear doleful, sombre, and forbidding. Only occasionally speak of your blessings and pleasures, your successes and profits, or of anything bright, cheerful, and amusing. Be sure not to let any sunshine into your nature, and specially sure not to let any out, if by any means it should creep in. Be as cold as winter, as dreary as a fall rain, and as dismal as a cold fog. Don't forget to be unapproachable, curt, and reticent; and by all means let your manners be stiff, blunt, and forbidding."

A QUESTIONABLE ACT.—In referring to a pamphlet which has lately been circulated, laudatory of a system of crown- and bridge-work, to which is added the certificates of six teachers in dental schools, who append their official signatures as deans, secretaries, and professors, Dr. Barrett, in the *Dental Practitioner*, asks, "Did the various faculties authorize them to do this? If not, they certainly have committed a kind of forgery, perhaps venial because common, and because committed without any base motive, aside from an unseemly vanity. What right has any member of a faculty with which others are connected to compromise them by virtually appending their names to a certificate which they may not approve? Who gave him authority to certify, as dean or professor, that his college approves and endorses an article that is offered for sale? By what right does he, in the absence of a special approving vote, drag the name of an educational institution through the muck of the patent office? Is this case the teachers actually assume to give the college endorsement to a special method of adopting gold crowns to the six anterior teeth. Surely their wits must have been wool-gathering when they did such an unprofessional thing as this, —or did the advertiser append their titles without authority?"

Current News.

NEW JERSEY STATE DENTAL SOCIETY.

FIRST DAY.

THE Twenty-eighth Annual Session of the New Jersey State Dental Association commenced in the Auditorium, Asbury Park, N. J., July 21, 1898.

At the opening session the annual address of the president, J. L. Crater, of Orange, was delivered. He dwelt upon the work of the society during the past year, and reported that there had been no deaths. He also referred to the fact that the treasury was in a flourishing condition.

The roll was called and several names were proposed for membership. Reports were also received at the morning session from the National Museum at Washington and the National Dental Association.

At the afternoon session the following essays were read: "A New Sectional Block Tooth," by Allison R. Lawshe, D.D.S., of Trenton; "Practical Experience with a few Homœopathic Remedies in Dental Practice," by William J. Wallace, M.D., of Glen Falls, N. Y.; "An Effective Method of treating Chronic Alveolar Abscess and Molars having Exposed Pulp Difficult to extirpate," by Frank G. Gregory, D.D.S., of Newark.

Two essays of considerable interest occupied the time of the evening session. The subject of the first was: "A Study of the Physiological and Pathological Conditions of the Apical Portion of the Cementum," by I. P. Wilson, D.D.S., of Burlington, Iowa.

This was followed by J. A. Waas, of Hammonton, N. J., who read an essay on "My Experience with Nerve Mummification."

SECOND DAY.

The second day's sessions were held in the Auditorium. President J. L. Crater, of Orange, was in the chair, and the roll call in the morning showed about one hundred and fifty delegates present.

The morning session was devoted to the reading and discussion of several papers.

At this session the following papers were read: "Alveolar Abscess and Caries of the Maxilla," by W. G. Chase, D.D.S., Phila-

delphia; "A Plea for the More Scientific and Careful Study of Materia Medica as a Branch of Dental Education," by Henry H. Merrell, Ph.D., M.D., Chicago; "Details of an Amalgam Filling, exhibiting a Regulating Appliance for regaining the Interproximate Space," by George W. Schwartz, M.D., D.D.S., Chicago; "The Evolution of Dental Materia Medica," by William H. Trueman, D.D.S., Philadelphia.

The afternoon session was devoted to clinics.

During the afternoon several interesting clinics were performed in the presence of a large gathering of dentists from all parts of the State. Dr. A. Irwin, Camden, "A Case in Orthodontia;" Dr. C. LeRoy, New York, "Filling with the New S. S. W. Moss Gold;" Dr. D. C. Baker, New York, "Movable Bridge-Work and Crown-Work;" Dr. H. C. Register, Philadelphia, "The Register Method of Operating;" D. Ashley Faught, Philadelphia, "A New Process of Practical Work;" Dr. Charles A. Meeker, Newark, N. J., "Bleaching a Tooth by Cataphoresis."

THIRD DAY.

The election of officers for the ensuing year was the principal business. The election resulted as follows:

President, Dr. J. Allen Osmun, Newark; Vice-President, W. E. Truex, Freehold; Secretary, C. A. Meeker, Newark; Treasurer, H. A. Hull, New Brunswick.

Executive Committee.—Oscar Adelberg, Elizabeth; F. E. Riley, Newark; F. G. Gregory, Newark; R. M. Sanger, East Orange.

Membership Committee.—F. L. Hindle, New Brunswick; F. L. Fish, Newark; C. S. Hardy, Summit; C. W. Hoblitzell, Jersey City; W. H. Pruden, Paterson.

Dr. J. C. Barlow, of Jersey City, was recommended to the governor as a proper man for reappointment as a member of the State Board of Examination and Registration in Dentistry. Dr. L. Ashley Faught, of Philadelphia, was elected an honorary member of the Society.

During the morning a paper on "Dental Histology" was read by H. C. Register, D.D.S., of Philadelphia.

Before adjournment the following new members were elected: J. Starr Dunning, of Paterson; R. W. Emerson, of Plainfield; A. R. Lawshe, of Trenton; R. W. Jewett, of Keyport; Theodore Van Syckle, of Princeton; J. W. Fisher, of East Orange; and C. W. Hayden, Jr., of Hackensack.

The chairmen of the various committees all rendered detailed

reports of the work under their provision. These reports were all received and filed, and will appear in the official printed proceedings of the sessions.

SOUTHERN BRANCH OF THE NATIONAL DENTAL ASSOCIATION, SECOND ANNUAL MEETING, NEW ORLEANS, LA., FEBRUARY 9, 10, 11, AND 13, 1899.

List of committees for the joint meeting of the Southern Branch of the National Dental Association and the Louisiana State Dental Society:

No. 1. Committee of Arrangements, in subdivisions: Transportation Committee, Dr. Joseph Bauer (S.B.N.D.A.), chairman, New Orleans, La. Hotels and Quarters Committee, Dr. J. Rollo Knapp (S.B.N.D.A.), chairman, New Orleans, La. Hall, Exhibits, and Arrangements Committee, Dr. L. D. Archinard (L.S.D.S.), chairman, New Orleans, La.

No. 2. Committee on Clinics, Dr. T. P. Hinman (S.B.N.D.A.), chairman, Atlanta, Ga. Committee on Clinics (Louisiana State Dental Society), Dr. And. G. Friedrichs (L.S.D.S.), chairman, New Orleans, La.

No. 3. Committee on Publication, Dr. Shep. W. Foster (S.B.N.D.A.), chairman *ex officio*, Atlanta, Ga.

No. 4. Committee on Oral Hygiene, Dr. L. M. Cowardin, chairman, Richmond, Va.

No. 5. Committee on Prosthetic Dentistry, Dr. J. A. Dale, chairman, Nashville, Tenn.

No. 6. Committee on Orthodontia and Oral Surgery, Dr. Geo. Hardy, chairman, Baltimore, Md.

No. 7. Committee on Operative Dentistry, Dr. J. G. Fife, chairman, Dallas, Texas.

No. 8. Committee on Chemistry, Metallurgy, and Anatomy, Dr. Albert B. King, chairman, Baltimore, Md.

No. 9. Committee on Pathology, Materia Medica, and Therapeutics, Dr. H. H. Johnson, chairman, Macon, Ga.

No. 10. Committee on Microscopy, Histology, and Bacteriology, Dr. W. T. Martin, chairman, Yazoo City, Miss.

No. 11. Committee on Appliances and Improvements, Dr. T. M. Allen, chairman, Birmingham, Ala.

No. 12. Committee on Education, Literature, and Voluntary and Special Essays, Dr. T. P. Whitby, chairman, Selma, Ala.

Entertainment Committee, Dr. Joseph Bauer (L.S.D.S.), chairman, New Orleans, La.

Carnival Balls Invitations Committee, Dr. J. Rollo Knapp (S.B.N.D.A.), chairman, New Orleans, La.

C. L. ALEXANDER,

Corresponding Secretary, Southern Branch National Dental Association.

CHARLOTTE, N. C., July 12, 1898.

SOUTHERN CALIFORNIA DENTAL ASSOCIATION.

A MEETING was held in Los Angeles, on June 23, by the dentists of Southern California for the purpose of organizing a dental society.

About fifty members of the profession were present, and organized the Southern California Dental Association, electing the following officers:

President, Dr. W. A. Smith, Los Angeles; First Vice-President, Dr. H. R. Harbison, San Diego; Second Vice-President, Dr. C. W. Sylvester, Riverside; Treasurer, Dr. J. M. White, Los Angeles; Secretary, Dr. L. E. Ford, 118½ South Spring Street, Los Angeles.

The society will hold its first regular meeting on September 2, 1898, in San Diego, Cal.

L. E. FORD, D.D.S.,
Secretary.

MEETING OF THE VERMONT STATE BOARD OF DENTAL EXAMINERS.

THE next meeting of the Vermont State Board of Dental Examiners will be held at the Pavilion Hotel, Montpelier, October 18, 1898, 2.20 o'clock in the afternoon.

GEO. F. CHENEY,
Secretary.

ST. JOHNSBURY, VT.

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Original Communications.¹

ANÆSTHETICS.*

BY H. H. BURCHARD, M.D., D.D.S., PHILADELPHIA.

FOR purposes of convenient classification, and as an aid to memorizing, I have classed nearly all of the drugs used in dentistry under three heads,—antiseptics, anæsthetics, and astringents. We have discussed the antiseptics, their composition, and their specific effects upon the protoplasm of bacteria and their waste products, together with such chemical features and properties of each substance as give them distinctiveness.

To-day we begin the study of the second class,—the second group,—classified under the head of anæsthetics. You will find in your note-books that I have defined anæsthetics as agents which diminish the reception, transmission, or perception of impressions which cause pain.

There is another word applied to agents which have the power of preventing or abolishing pain,—*i.e.*, analgesics. These words are frequently used interchangeably, but they are not entirely synonymous.

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

* Report of two of a series of lectures on pharmacology.

The word *anæsthesia* was coined by the late Oliver Wendell Holmes, for many years the professor of Anatomy in the Harvard Medical School, to designate the state of insensibility produced by the inhalation of ether. You will see, therefore, that it implies a condition associated with loss of consciousness. Its etymology is from the Greek words *an*, without, and *aisthesis*, sensation; so that the word is admirably descriptive. An analgesic, strictly defined, is an agent which removes existing pain, *an*, without, and *algos*, pain.

There is no implied or stated loss of consciousness in the content of this word. It would seem, then, to be preferable to apply the term *anæsthetics* to those agents whose administration prevents pain by abolishing consciousness; *analgesics*, to those agents which do not cause a loss of consciousness. We will take up first the study of the agents which we have called general *anæsthetics*.

At the very beginning of this study we are confronted with two words about which there is much diversity of opinion as to definition. These are pain and consciousness; now the definition of these words depends largely upon the point of view,—that is, the way we look at them.

We will ignore entirely the metaphysical side of the question, which can lead to nothing but confusion and an ultimate confession of ignorance,—that is, relative ignorance. Metaphysical research has, as a matter of fact, but little if any practical value in the study of the sciences, excepting perhaps that of theology. Its study has, however, this virtue, it teaches us the limitations of human knowledge, but utterly fails to give us nineteenth and twentieth century science. In the same vein, we will not view the subject of consciousness as the metaphysician would view it, but say at the outset that for our present purposes pain and consciousness are things to be studied in the physiological laboratory. First for a definition of pain: we cannot define it absolutely, so let us call it a degree or condition of sensation which causes physical discomfort. Here again is a difficulty, we have the word sensation which requires explanation and study. It implies that the individual is conscious,—*i.e.*, has consciousness of something very wrong with the body at some point or other. You see how we are driven back to a study of consciousness. When we speak of consciousness in man, we mean his recognition of his relations with external objects through the agency of the five senses. It might be objected to here, that a man might have lost all five of his senses and yet be conscious. To this objection may be retorted, How can we pos-

sibly tell that consciousness exists in such a person, and, secondly, that such a man has not consciousness as we understand it, for his state of mind is governed entirely by old, not new, impressions made upon his brain-cells? We are accustomed to associate all thinking, all consciousness, with the presence of a brain,—that is, a cerebrum; but any physiologist could point out the fallacy of this; for while, of course, we cannot positively affirm it, it is probable that even mass of living matter, be it an amoeba, a radiate, a mollusk, a fish, or a mammal, has in some degree the quality which, in its most highly evolved condition, is the consciousness of man.

The physiologist recognizes that before we can have sensation or a knowledge of surroundings three things are essential. First, a nerve-centre or centres in which consciousness or sensation is actually formed; secondly, a means of receiving external impressions; and, thirdly, a line of connection between these two; that is, there must be a perceptive centre, a receptive apparatus, and a transmitting apparatus. In studying the subject of anæsthetics in relation to man, this means that in sensation there are involved a perceptive apparatus, situated in the outer portion of the cortex of the brain's greatest ganglia, the cerebrum; next, a receiving apparatus, or the endings of nerves of sensation and nerves of special sensation; next, the nerve-paths connecting these two, the centre and the periphery. Sensation of any kind consists in the reception by the endings of special (sensory and special sense) nerves, the transmission of this sensation along nerves and up the spinal cord, thence to the cortex of the brain. So long as the terminals of the nerves, the sensory nerve-endings, receive only stimuli or impulses measured within an unknown amount, the impulses are carried to the brain, and produce what is called normal sensation. That is, let us say, a sharpened point is placed against the finger and pressed upon by a gradually increasing weight, until an ounce in weight is used; this produces no actual discomfort, the nerve terminals are not over-stimulated, are not irritated. Increase the weight to, say, four ounces, and a feeling of discomfort is noted, the terminals are over-stimulated, and the impressions carried to the brain are translated into pain.

The existence of the pain, we say then, is determined by the function of brain-cells.

It has been shown by Ferrier, in experiments upon monkeys, that if we cut out the posterior portion of the cerebrum (near the hippocampus), the monkey is incapable of the touch sense; and when its surface, the ends of its sensory nerves, is irritated, the animal gives no evidence of pain, showing that the pain sense is

located in this portion of the brain. It is in the cortex of the brain, also, that physiologists and psychologists believe the numerous centres which preside over idea-formation, imagination, and all of the higher faculties are located. Now, of course, if we remove or destroy these areas, function will be destroyed. So that if we remove the portion of the brain called the tactile centre, we prevent sensation and pain,—that is, we can prevent pain by destroying the perceptive centre.

Again, if we destroy the ends of the sensory nerves, they cannot receive impressions, hence we can prevent pain by destroying the receptive apparatus.

Still more, if we have both perceptive centre and receptive nerve-endings healthy, and cut or destroy the pathway between perceptive centres and sensory nerve-endings, although the ends of these nerves may be irritated, there can be no pain, because the irritation cannot be carried to the pain-centre,—that is, we may prevent pain by destroying transmission.

To recapitulate: we may induce a condition of *anæsthesia*, may prevent pain, first, by preventing the reception of painful impressions; secondly, by preventing their transmission; thirdly, by preventing their perception.

If we destroy the function of the perceptive centre, we have a general abolition of sensation, a general *anæsthesia*. If we destroy the function of the transmitting apparatus,—the spinal cord,—it will depend upon the point of the injury what the extent of the *anæsthesia* will be; for example, if the spinal cord were cut above the lumbar region, we would have paralysis of the lower extremities; if cut in the cervical region, of the upper extremities also. The receptive apparatus, when destroyed, is only destroyed over a comparatively small surface, hence this would be followed by *anæsthesia* (local) of that region alone. Now it is not necessary that these parts, any of them, be actually destroyed to prevent them performing their function. For example, the perceptive centre is made up of special nerve-cells, which, when in normal condition, preside over or perform the function named. To perform their function they must have what any and all cells must have, the proper conditions of life,—that is, they must receive a proper food-supply, including oxygen, their waste material (the ashes of the vital furnace) must be removed, and of course they must be healthy in themselves. If we interfere with their vitality and their nutrition, we interfere with their function. If we deprive them of oxygen or food, we destroy their function; again, if we es-

tablish such a condition in them that they cannot take up oxygen, we destroy their function. Can this be done? Yes; and the agents which are capable of doing it are called general anæsthetics.

Having discussed the conditions existing as a basis, and the object to be obtained, the next step is a study of the agents which can accomplish this object. The principal ones of this group of general anæsthetics are chloroform, ether, and nitrous oxide.

To have an intelligent idea of how these agents act, it is essential that we should examine their composition. Let us take up, first, chloroform. You will notice by its chemical formula, CHCl_3 , that it belongs to what your professor of chemistry tells you is the monocarbon series.

This series begins with the body called marsh gas, or methane, its formula being CH_4 . This gas, when inhaled, is found to lessen the function of the perceptive centre. Replace one of the hydrogen atoms by chlorine, and we have methyl chloride, which has a like property, but more pronounced; instead of having now a heavy gas we have a very light and volatile fluid: we shall speak again of this substance. Substitute two chlorine atoms, and we have bichloride of methylene, CH_2Cl_2 , a stronger anæsthetic and a heavier fluid. Replace three hydrogen atoms by three of chlorine, and there is formed a powerful anæsthetic and a still heavier fluid, CHCl_3 , or chloroform. Displace all of the hydrogen by chlorine, and we have CCl_4 , tetrachloride of carbon, a heavier fluid and an anæsthetic. Methane $\text{CH}_4 - \text{H} = \text{CH}_3$, or methyl; methyl + $\text{Cl} = \text{CH}_3\text{Cl}$, methyl chloride. $\text{CH}_4 - \text{H}_2 = \text{CH}_2$, or methylene; methylene + $\text{Cl}_2 = \text{CH}_2\text{Cl}_2$, methylene bichloride. $\text{CH}_4 - \text{H}_3 = \text{C}$, or formyl; formyl + $\text{Cl}_3 = \text{CHCl}_3$, formyl trichloride or chloroform. $\text{CH}_4 - \text{H}_4 = \text{C} + \text{Cl}_4 = \text{CCl}_4$, tetrachloride of carbon. While, as stated, all of these substances have anæsthetic power, these are by no means all equally useful in this field. Let us examine the vapor density: The greater the weight of the molecule of any of these substances the less volatile it is, and the more prolonged will be its effects upon the nervous system. Beginning with CH_4 , we have a molecular weight of 16; with chloride of methyl, a molecular weight of 47.5; with chloroform the weight is 118.5. Each atom of chlorine (35.5) as it replaces hydrogen (H) adds greatly to the density of the substance and increases its vapor density and boiling-point. So that when inhaled the effects of these agents will be prolonged according to the number of chlorine atoms they contain. With the base of methane, CH_4 , we can construct still other anæsthetics; instead of replacing hydrogen atoms by chlorine, bromine may be

the element substituted. Thus, $\text{CH}_3 - \text{H} = \text{CH}_3$, or methyl; $\text{CH}_3 + \text{Br} = \text{CH}_3\text{Br}$, methyl bromide.

When $\text{CH}_3 - \text{H}$, or formyl, is combined with Br_3 , we have CHBr_3 , formyl bromide, called bromoform; both of these substances are anæsthetics. The text-books state that the effects of bromoform are much more transient than those of chloroform, but if we examine its molecular weight, $\text{CHBr}_3 - 12 + 1 + 239.25 = 252.25$, and compare it with that of chloroform, $\text{CHCl}_3 - 12 + 1 + 106.5 = 119.5$, we see that there has probably been some error of observation as to its effects. We may also form anæsthetics by substituting iodine for hydrogen in the methane nucleus, $\text{CH}_3 - \text{H} = \text{methyl}$; $\text{CH}_3 + \text{I} = \text{CH}_3\text{I}$, methyl iodide. If we replace three hydrogen atoms by three of iodine, we have $\text{CH} + \text{I}_3 = \text{CHI}_3$, or formyl triiodide, iodoform. We see that here we have, instead of a volatile fluid and a body of low molecular weight, a very heavy molecule and a solid body, $-\text{CHI}_3$ ($12 + 1 + 381 = 394$).

The next member of our anæsthetic agents is ether or ethyl oxide; it is derived from the dicarbon series, $-\text{C}_2\text{H}_5 = \text{ethane}$. Ethane deprived of an atom of hydrogen becomes C_2H_5 , ethyl; this behaves as does methyl as a monovalent radical, entering into combination with chlorine, bromine, and iodine, and forming a second class of anæsthetics, $\text{C}_2\text{H}_5 + \text{Cl} = \text{ethyl chloride}$ ($24 + 5 + 35.5 = 64.5$), a very volatile fluid, and, although a general anæsthetic, you will see from its molecular weight that it is too volatile for practical use: we will refer to it again under the head of local anæsthetics. $\text{C}_2\text{H}_5 - \text{H} = \text{ethylene}$, $\text{C}_2\text{H}_5 + \text{Cl}_2 = \text{CH}_2\text{Cl}_2$, or ethylene bichloride, called Dutch liquid, an anæsthetic having theoretically great usefulness, but it has been used but little. The combination with iodine, $\text{C}_2\text{H}_5\text{I}$, although a strong anæsthetic, is not used for this purpose. The combination with bromine, $\text{C}_2\text{H}_5\text{Br}$ (ethyl bromide), is a powerful anæsthetic, which has had limited use.

The interesting and important member of this group is ethylic ether, $(\text{C}_2\text{H}_5)_2\text{O}$, ethyl oxide. It may aid you in remembering the chemical composition of this substance by regarding it as a substitution product of water. Let us represent water graphically $\text{H} - \text{O} - \text{H}$, two atoms of monovalent hydrogen held in combination by the two bonds of bivalent oxygen. Replace one monovalent element by the monovalent radical C_2H_5 , or ethyl, and we have $(\text{C}_2\text{H}_5) - \text{O} - \text{H}$, ethyl hydroxide or alcohol. Replace both hydrogen atoms by two molecules of ethyl, and we have $(\text{C}_2\text{H}_5) - \text{O} - (\text{C}_2\text{H}_5) = \text{ethyl oxide or ethylic ether}$.

The last member of our series is nitrous oxide, or nitrogen monoxide. If you will observe a person who is being anæsthetized by nitrous oxide you will be struck by the livid appearance of the face, the bluishness of the lips, and ghastly look about the eyes; from your studies in physiology you could recognize the condition to be what is called cyanotic; that there appears to be an absence of oxygen or an excess of carbon dioxide in the blood, and one might jump to the conclusion that this was the cause of the anæsthesia, as indeed it might be; but if you will admit, after the Thomas method, atmospheric air with the nitrous oxide, still anæsthesia will be produced, although more slowly. Admit oxygen, after the Hewitt method, and while there is an entire absence of the cyanotic appearance, anæsthesia is brought about. We are then driven to the conclusion that nitrous oxide has a specific anæsthetic effect, operating upon cerebral nerve-centres. We pass next to a consideration of how these agents act upon consciousness and sensation. First and foremost, what are their probable cellular effects; next, what are their gross and visible effects.

There is no better or more rational explanation at present than that known as the semi-coagulation theory of Claude Bernard. That is, it has been shown that certain agents, such, for example, as morphine (Binz), have the power of causing a contraction of nerve-cells, similar to that caused by quinine upon white blood-corpuscles; a form of spasm of the cell occurs, a fixation of the protoplasm which is probably the first stage of coagulation, and it is probable that alcohols, chloroform, and ethers have a similar power,—that is, they interfere with the normal function of brain-cells. Applied in small doses, they stimulate, next over-stimulate, and next paralyze, for the time being, the function of these cells. The probable mode of action is that of a combination of the anæsthetic, carried to the cells, in loose chemical bonds with the protoplasm, or at least a portion of the cell contents. While this union persists, the cell cannot oxidize properly,—i.e., cannot functionate,—and waste products of cell action are not removed. As soon as the weak chemical bonds are dissociated the function of the cell returns. The length of time the effects persist depends upon the volatility, the vapor density; hence the molecular weight of the agent employed; the lower the molecular weight the more rapidly the substance is eliminated, the more transient is the anæsthesia; and *vice versa*, the greater the molecular weight the more prolonged the anæsthesia; thus a light gas (N_2O) is much more transient in its effects than the heavy vapor of chloroform. An anæsthetic taken in liquid form

has still more prolonged action ; the anæsthetic solids are usually impracticable as true anæsthetics, but are used in small doses as anodynes.

If you will watch a person carefully who is being anæsthetized, you will note that the highest mental functions are the first to be affected. Imagination and kindred functions are the first to succumb ; next, the special senses are affected in the order of their nerve emergence ; next, lower functions succumb, until all consciousness is gone, and the respiration and circulation continue, although affected. Increase the amount of the drug and soon there is evidence that the nervous centre of respiration is paralyzed, respiration ceases ; continue the administration and the heart-centre is paralyzed, and death results.

When respiration ceases, of course oxidation ceases, and if the asphyxia is prolonged beyond very few minutes death results. It has been taught and shown you how the muscular movements of respiration may be simulated,—that is, how to practise artificial respiration. This is a subject of much importance, for even though the centre of respiration be paralyzed, if we can cause the expansion and contraction of the chest cavity, the ingress of supplies of oxygen will continue ; and as this supply is intimately concerned with ridding the nerve-centre of the anæsthetic, the importance of artificial respiration becomes evident. If we can maintain this artificial respiration until the cells free themselves of the drug, the respiratory centre resumes its function, as do the other centres in the reverse order of their affection. The more volatile the agent employed the more quickly it is eliminated, hence ether is gotten rid of more quickly than chloroform.

Leaving now the discussion of agents which produce anæsthesia by abolishing perception, we pass to the second group, those which prevent the reception of impulses which would cause pain.

There are drugs which, when administered, lessen the function of the terminals of sensory nerves, without abolishing consciousness or inducing sleep ; these are various narcotics ; their discussion is reserved for another time. The agents which belong to our present study are those known as local anæsthetics. Of course, the reception of impressions may be prevented by destroying the receptive apparatus, by cutting or burning, for example ; heat or cauterizing chemicals will bring about this end ; but this is not inducing local anæsthesia. Just here is another distinction between the words anæsthesia and analgesia ; an anæsthetic implies a temporary cessation of sensation, but in analgesia we imply that

pain is prevented by any means available ; thus carbolic acid applied to the skin to render painless the opening of an abscess is an analgesic, but it destroys the tissue to which it is applied ; zinc chloride applied to dentine has an analgesic effect, but it destroys instead of holding in abeyance the function of the receptive apparatus. The function of the receptive apparatus may be lessened by applications of cold, as by applying a mixture of ice and salt to any part ; one of the most noticeable effects of accidental freezing of the extremities, as the toes or ears, is an entire absence of sensation in the frozen part. You must remember, however, that after freezing, an inflammatory reaction, often violent, occurs when the temperature of the parts is raised, and ulceration commonly results (chilblain) in consequence. It is to prevent this violent vascular reaction that frozen parts are rubbed with snow instead of being warmed.

The volatile liquids, methyl chloride, CH_3Cl , and ethyl chloride, $\text{C}_2\text{H}_5\text{Cl}$, directed in a spray against any part, will by their rapid evaporation produce the same effects as freezing. Any highly volatile substance will have the same effect ; a spray of alcohol, CH_3HO , of ether (C_2H_5) $_2\text{O}$, of chloroform, CHCl_3 , or of liquid nitrous oxide, N_2O , will cause freezing, the rapidity and extent of the freezing being governed by the volatility of the agent applied.

We find among drugs many agents which are capable of lessening the irritability and reducing the function of the terminals of the sensory nerves, as, for example, the alkaloids veratria and aconitia, which are often applied in ointment to relieve painful affections of the fifth cranial nerve. You will find use for them in dentistry to relieve the pain, attending difficult eruption of lower third molars ; we will discuss their mode of action at some other time. Many of these agents exhibit before their anæsthetic effect an irritant action, which has led Liebreich to call the effect produced by them "anæsthetica dolorosa." The interesting members of this group are the benzoyl derivatives, the principal of which is cocaine. We find among several of the local anæsthetics an interesting chemical relationship full of significance, there being a group of substances the members of which possess the power of lessening the function of sensory nerve terminals, which form a chemical chain. First, atropine, the tropate of tropine : this drug possesses the power of paralyzing certain nerve terminals ; combine with tropine, benzoic acid instead of tropic acid, and we have benzoyl tropine, or homatropine, which has a marked local anæsthetic action.

The next substance also contains the benzoyl and tropic elements : it is benzoyl pseudotropine, or tropacocaine ; all three of

these agents are irritant anæsthetics, causing some degree of hyperæmia when applied to a mucous surface. To the benzoyl nucleus add methyl and ecgonine, and we have methyl benzoyl ecgonine, or cocaine.

Cocaine is, by boiling, split up into methylic alcohol, benzoic acid, and ecgonine. The leaves of coca contain another substance in which isatropyl replaces benzoyl, forming a body known as isatropylcocaine, a cardiac poison. Another agent has been recently introduced among local anæsthetics, containing benzoyl and methyl, it is called eucaine. It was its chemical composition which indicated that it would act as a local anæsthetic. Unlike cocaine, this substance is not split up, decomposed, by boiling in distilled water. The chain as we now have it is,—

Atropine	the tropate of tropine.
Homatropine	benzoyl tropine.
Tropacocaine	benzoyl pseudotropine.
Cocaine	benzoyl methyl ecgonine.
Eucaine	benzoyl methyl-tetramethyl ester +.

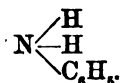
Any of these agents, placed on a mucous surface, will, after a period, paralyze the sensory nerve terminations,—that is, will produce local anæsthesia. The last three members are most marked in power. Tropacocaine and eucaine both produce more or less dilatation of the vessels (hyperæmia) of the parts. Cocaine causes contraction of the vessels (ischæmia) of a part. This has an important clinical bearing. It is when these drugs are taken internally, by the stomach or by hypodermic injection, that we find the greatest importance in regard to their effects. For example, while in large doses tropacocaine, cocaine, and eucaine all cause paralysis of the respiratory centre, the paralyzant action, hence danger, is much more marked with cocaine than with either of the other two. When either of these substances is injected into a part by means of a hypodermic syringe, a comparatively wide area of insensibility is found. When injected about the trunk of a nerve, a portion of the transmission pathway, insensitivity and anæsthesia will be found in the area supplied by the terminals of the nerve; for example, injected deep down upon the inner and posterior portion of the inferior maxillary bone, a wide area of anæsthesia results,—that is, it paralyzes the power of transmission, so that cocaine can cause anæsthesia by abolishing reception and transmission; more than this, if applied to the cortex of the brain, it can paralyze the nerve-centres and prevent perception.

The succeeding group of agents includes those which induce anæsthesia by preventing the transmission of painful impulses from the receptive to the perceptive apparatus. We have seen that cocaine possesses this power, as do also many of the general anæsthetics, if applied to nerve-trunks. Dr. Roberts Bartholow several years ago introduced the practice of injecting chloroform deep about the trunk of the sciatic nerve for the relief of sciatica.

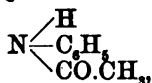
A group of agents having the power of suspending transmission include substances resembling alkaloids which have been introduced in the past fifteen years; they are known as the coal-tar derivatives. These are extremely interesting bodies; they resemble alkaloids in effects and chemical composition; they may be regarded as substitution compounds of ammonia,—that is, ammonia (NH_3) written graphically,



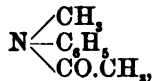
may have one, two, or three hydrogen atoms replaced by one or more organic radicals:



Replacing one hydrogen atom by benzene (C_6H_5), we have aniline. Replacing one hydrogen atom by phenyl (C_6H_5), another by acetyl $\text{CO}\cdot\text{CH}_3$, or ($\text{C}_2\text{H}_3\text{O}$), we have



forming phenylacetamide, or acetanilide, commonly called anti-febrine. If we replace the remaining hydrogen atom by CH_3 , or methyl, we have



another substance called methyl acetanilide or exalgin. The introduction of the methyl radical increases the analgesic power. These may be taken as types of these compound ammonias, all of which have the power of reducing the transmission of painful impressions. This introduces the principle of foretelling the probable effects of drugs which may be made in the laboratory, built up, synthetic drugs, by knowing their chemical composition. You will hear much of this phase of pharmacology from now on.

DOUBLE RESECTION OF THE LOWER MAXILLA.

BY EUGENE S. TALBOT, M.D., D.D.S.¹

IN the *Dental Cosmos* for August, 1898, appears an article by Dr. Edward H. Angle, of St. Louis, upon the above subject, in which he claims to be the first to suggest this operation, and that it had been discussed for four years by surgeons with regard to the prognosis, hence he deems some suggestions as to technique and plans of fixation not amiss, especially since he claims, if the operation be properly performed, it may become of considerable use and importance. In those extreme types of malocclusion familiar to every one, he remarks, the proper functions of the teeth have become almost wholly impaired, as well as speech greatly interfered with, and the appearance of the patient transformed to marked deformity, constantly attracting attention and comment and being a source of humiliation to the patient, whose condition, if he be possessed of a sensitive nature, becomes truly pathetic.

The late Dr. W. W. Allport, who suggested this operation over four decades ago, consulted the late Dr. Brainard, of Chicago, admittedly then one of the most skilful American surgeons, in regard to its propriety. Sections of the inferior maxilla were to be removed at the location of the first bicuspid. The section to be cut in such a manner as to bring the incisors directly in contact with the superior incisors, and not throw the anterior part of the jaw downward, as would be the case in Dr. Angle's operation. Later, he consulted Drs. Moses Gunn and Powell, of Chicago. They were all of the opinion that such an operation could not be successful, first, owing to the impossibility (at that time, as they supposed) of holding the parts steady in place. Second, that the arteries and nerves would not unite, thus producing death of the pulps or teeth in the anterior part of the jaw; hence the operation was not performed. The first difficulty can, no doubt, be overcome by modern methods. The second requires demonstration.

The report of a case in the July *Dental Cosmos* does not indicate a very successful operation.

"At the end of the third week Dr. Blair brought Mr. K. to my (Dr. James W. Whipple, St. Louis, Mo.) office, when, to my regret, I found a very serious and unfortunate condition of affairs existing. The means adopted for holding the superior borders of the dissevered maxilla in position had proved to be entirely ineffective.

¹ Fellow of the Chicago Academy of Medicine.

The parts had failed to unite on either side. On the left side there was an effusion of bloody pus, which oozed into the mouth when the parts were pressed together. The right side was in a better condition, but no union of the bone had been effected. The jaw was stiff and sore, and the teeth could be separated from the upper only a short distance."

The operation was performed December 19; Dr. Whipple was still trying to adjust an appliance to hold the parts together on the 26th of the following April. If the pulps in the eight anterior teeth be alive, it is a revelation in vitality of nerve and blood-vessel tissue.

If such an operation were possible I should quite disagree with Dr. Angle as to the method of improving the appearance of this person's face. What he needs is an expression of character. The deformity is the result of arrest of development of the face and superior maxilla rather than excessive development of the lower jaw, hence I should suggest an improvement of the face generally. The deformity should be corrected by bringing forward the upper teeth (making the cuspids prominent) and the alæ of the nose, thus giving character to the face rather than increasing the deformity and further humiliating the patient.

ASSOCIATE LESIONS OF THE FIRST DENTITION.¹

BY HARRY L. BELCHER, D.D.S., BUFFALO, N. Y.

It is not my purpose, in presenting this paper, to go into dental evolution, but to take up a few pathological conditions, and touch upon some things which may possibly be of benefit to us in everyday practice.

The process of dentition, while a physiological one, is liable to be one of continuous irritation. It is not, however, by any means understood that all infantile diseases are influenced by, or associated with, dentition. Sometimes infants are tortured, and in many cases have an existing disease aggravated, by lancing and cutting. Dental irritation is influenced by the slowness or rapidity of the evolution of the teeth, by the state of health of the infant, and by idiosyncrasy. We would not anticipate from the eruption of a single tooth the trouble of five or six. Some children erupt their

¹ Read before the Barrettonian Society and Buffalo Dental Association.

teeth in mass, while in the case of others it is a process of regularity and harmony. According to Dr. A. Brothers, dentition is rarely, if ever, a direct cause of death. The calculations of Dr. Arbuthnot are that, at the period of dentition, one child in every ten has its life destroyed through the associated and influenced lesions of that age.

Retarded dentition may occur in healthy children, or in entire families.

The period of eruption of the first teeth begins in healthy children at about six and a half months, and is usually complete at thirty months.

Dentition is retarded if the child is not properly fed. The quality of the first teeth depends largely on the physical qualities of the child, and on the ability of the mother to properly nourish the infant.

Congenital diseases—tuberculosis, syphilis, etc.—seem to have a retarding effect on dentition. Scrofulosis seems to hasten the eruption of the first teeth, but does not affect the later teeth.

In cases of undeveloped brain—idiocy—there is a marked retardation during the entire period of dentition.

Chronic diseases have a retarding power over the first teeth, but do not seem to influence the later teeth.

Premature dentition is attended with more danger than later ones. Peabody says, "The later the teeth erupt the stronger and better they will be."

"An abnormal dentition" is indicated by a dry, hot mouth, "swollen gums, tense, tender, and shining."

The diseases, if they may be so called, associated with and dependent on abnormal dentition are localized stomatitis, irritative fever, diarrhœa, spasms, eruptions upon skin, especially of scalp and face.

The first indication of the condition dependent on advancing eruption consists in a sense of titillation, or itching, before any local sign is visible. The child is found disposed to rub the parts with anything coming into its hands, seeming most comfortable when biting upon a hard substance. Slavering is also associated with this stage. After a time tumefaction of the gums is observed.

Garretson says, "The shape and extent of face in the erupting tooth do not seem to have as much to do with the amount of irritation as one would naturally infer would be the case." He has had as much trouble from an erupting incisor as in the case of a four-cuspid molar. Bad and degenerating inflammations are al-

ways associated with constitutional conditions. In scrofulous children it is sometimes the case that a semi-gangrenous ulceration is the result of cutting a tooth,—which is quite troublesome to manage,—while in children of a mercurio-syphilitic cachexia such a condition will be even aggravated, the gums and continuity of mucous membrane looking as if it were impossible to keep the parts from breaking down into general ulceration.

According to some authorities Dr. Barrett concluded the diseases of childhood not to be due to, or dependent on, dentition. He says, "It comes from bad feeding (digestive disturbances), and not from the teeth." He clinches his argument with data to show the death-rate of children under three years of age, and the prevalence of zymotic diseases in certain wards of our own city, where sewerage is poor. He says, further, that there are no real disturbances of dentition unless it shows itself in the gums.

Too much stress cannot be laid on the diet. The stomach of an infant is very weak; can hardly be called a stomach. It may be likened to an enlarged portion of a common tube. Again, the mucous membrane of the intestines of an infant are tender and susceptible. Excess of food, or food not easy of digestion, irritates and excites these tissues, causing discharge or diarrhoea. Thus we see the necessity of a careful diet, and the adoption of hygienic measures.

LANCING.

In regard to lancing, the experienced eye of the operator will determine when this is necessary. Too early lancing is an evil, as the tissues heal and become hardened, calloused as it were, and make it more difficult for the teeth to erupt. When tumefaction of the gum is dependent on tooth eruption, and the child is in healthy condition, a certain evidence is found in the glistening character of the swelling, the part immediately over the tooth looking stretched and feverish. This tense look is nearly always present, and may under all circumstances be taken as an indication demanding the use of the lancet. Lancing in these cases affords almost instant relief. Personally, I do not think the lancet is used effectually. A tooth is to be lanced in consideration of its shape.

A single incision is all that is necessary with upper or lower front teeth. The incision should be made sufficiently deep to feel the lancet strike upon the enamel, being made on a line with the cutting edge of the tooth. With the posterior teeth, the cuspidati included, the crucial form of incision is demanded. This form will relieve the advancing cusps and afford the result desired.

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A sharp or razor-edged lancet is preferred by most operators, though the theory has been promulgated that a saw-edge lancet is to be preferred, as it tangles up the vessels, and thus is conducive to the formation of a clot. There certainly is less bleeding when this method is employed. It might be used to advantage on infants whose parents have a tendency to hemorrhage, though perhaps the bleeding that follows most lancing, increased as it is by the child's sucking, encouraged by the saline taste of blood, is advantageous in reducing inflammation.

THE CARE OF CHILDREN'S TEETH.

Some dentists dread to work on children's teeth. This is a mistake, and we must overcome it, for there is much at stake. This is one of the ways a practice can be built up. One of our most successful practitioners tells me that he secured some of his most influential patients by working for children, gaining the confidence of the little ones by his gentle procedure, and what is more, the confidence of the parents. We know the importance of preserving the temporary teeth as long as possible, for they nourish the permanent teeth, preserve the shape of the arch, prevent irregularities, etc.

A word from the dentist to the child has much more effect than from parents. Tell the child to use a tooth-brush carefully and with regularity. Note if they follow your suggestion. If so, remark on their improved appearance, or again speak more decidedly if you notice no improvement.

If possible, exclude parents from operating-room. They spoil authority. The child is not to be controlled, but looks to the parent for sympathy, and will not make an effort to control himself. After the dentist has obtained the confidence of the child he can do most anything, so long as he does not deceive.

I know of no suitable material with which to fill the roots of temporary teeth. As they must be absorbed, they cannot be filled with an insoluble compound.

In cases of exposure of the pulp, aristol makes an excellent soothing application. Oil of cloves and tannic acid are also recommended. Dr. Southwick suggests the use of a very minute quantity of arsenic in conjunction with carbolic acid.

We have to be satisfied with work that we would be heartily ashamed of in an adult, as it must be done painlessly and quickly. A child will not bear fatigue, and refuses to be hurt.

Though the pulp is much less sensitive in a child's tooth than

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in an adult's, it is much larger in proportion. One-third of a temporary tooth is taken up by the pulp. The pulp lies much nearer the surface, so great care must be taken not to expose it, though we can resort to capping with a greater expectation of success than with an adult.

Copper amalgam, if not abused in its use, makes an excellent filling for temporary teeth. The salts of copper having a stimulating effect on tooth-structure and pulp. It is especially valuable in fragile teeth. By some operators copper amalgam has been used indiscriminately and excessively, since which time it has received their condemnation. Notwithstanding this, it is a very valuable agent for the preservation of soft teeth, when used intelligently.

Nitrate of silver is a valuable agent to arrest superficial decay of children's teeth. This is especially valuable in early decay; it acts as a check; stimulates the tooth, and encourages secondary deposits. It is used in stick form, and as a solution. Very slight amounts can be used. This agent is rubbed over the decayed part, the tooth being first thoroughly dried. (I dry around it so that the silver will not be distributed through the saliva.)

In closing I will quote Dr. Allport: "The great requisite, as has been said, is to gain the child's confidence. I address myself to the child when I make an appointment, and not to the parent. I say, 'When can you come?' thus giving the little patient an impression of a confidential arrangement between himself and me. This often has a favorable effect upon the child, for children appreciate anything that looks like deference to their wishes, and they will usually meet you half-way when you treat them as principals, where they might be difficult of management if you made some mysterious arrangement with the parent, only half understood by them. The secret of handling our little patients successfully is to do but little at any time, avoiding anything like an air of mystery, and always dealing in perfect candor and honesty of intention with them."

REMINISCENCES OF A EUROPEAN TRIP TO THE INTERNATIONAL MEDICAL CONGRESS AT MOSCOW, RUSSIA, AUGUST 19 TO 26, 1897, AS A DELEGATE FROM THE AMERICAN MEDICAL ASSOCIATION AND THE ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.¹

BY W. G. A. BONWILL, D.D.S., PHILADELPHIA.

It is not at your request I assume this task. Before doing so your attention must be called to an incident in the experience gained when I was a delegate to several societies in Europe, in 1889.

My personal experiences were duly published in the INTERNATIONAL DENTAL JOURNAL. An editor of a western dental publication, in criticising, or rather commenting upon it, took the trouble to count all the "I's," and saw nothing beyond this worthy his attention. This article of the editor was, to me, a lesson which I have never forgotten. Meeting him some time after, he was thanked by me for calling public attention to the *personal pronoun*. No abuse was heaped upon him for this nor for slighting the rest of the article, as there was nothing therein that called for criticism or a passing notice. In all my career, not once has any criticism upon my work been given a reply from me. Such fanning a flame has no good results. Everything done by me has taken quite good care of itself. Time takes charge of such and balances the sheets in the end.

In the present effort to interest you no promise will be made as to how many "I's" will appear. There is some excuse in my case, as the line of work done by me has been unique, and I have had no occasion even to speak of the work of others; hence "I's" will of necessity loom up, and my friend will do me the favor, this time, to simply send me a personal communication as to whether there has been any improvement over the past, and, if he deems it prudent and courteous to an "old stage coacher," to remember that he often places himself in peril when he writes editorials. An old adage, "Oh, that mine enemy would write a book," should ever be kept in mind, even by younger men.

You must not expect me to give in detail the fullest experience of contact with many of my profession, as well as the medical, on a tour of nearly four months. My life was with them almost

¹ Read before the Odontological Society of Pennsylvania, March 12, 1898.

solely. It was the intention before leaving home to make a sacrifice of pleasure and live only in an atmosphere suitable to my ambition, and give to my brethren abroad whatever they felt was due from one with peculiar methods of practice, and, by both talk and demonstration, picture to them the instruments as invented, and used in his own way. To this end my dress-suit case was closely packed with dental and surgical engine and every appliance requisite for the programme laid out; which never left my hands from the time I left home, the 30th of July, until my return, 22d of October. Not knowing how the custom-houses in the many countries passed through, and especially on entering Russia, would look upon this enginery and traps, prudence dictated that the case should not go to the care of any other person.

Fortunately, no duty was asked of me and no one suspected me of being a Nihilist.

As to life on the steamer "Werra," there was a medical party of about fifty delegates on their way to Moscow, including several women M.D's., and only one dentist, besides myself, all of whom were strangers to me. The ten days on the ocean were charming, and yet I did not mix with the throng, as so much work had been laid out to prepare for the Congress. Never before had I written on "Pyorrhœa," but the programme of the Dental Section expected me to present a paper. When the essay was done it embraced sixty pages of foolscap. This, with three other articles, on subjects hitherto not made public, consumed much of the time; as also did the revision of one hundred and fifty poetical effusions and the revision of three hundred pages of typewritten matter against Evolution from the assumed stand-point of the Equilateral Triangle. You can imagine when this was done whether I did my share of talking while on the steamer.

Italy, being entirely new to me, caused forgetfulness of dental memories from the hour we landed at Gibraltar and Naples until we reached Milan. In all the principal cities I called upon dentists, but was shown nothing new except a *long white linen gown* worn by a dentist, I think, in Rome, to show his deep and long admiration of the Listerine process of antiseptis. It swept the floor, and one could well suppose that this was his principal garment for this hot climate, and he was surely running the germ theory as nearly into the ground (or dirt) as he could get it. It was an absurd effort to show off antiseptis; the same attempt I found in quite every place visited, several of which will be shown up as the abuse of this over-estimated and overvalued treatment.

In Italy a law has been obtained that will possibly cause every American dentist to leave that country. It compels every one who wishes to practise there to undergo an examination and graduate in one of the medical schools of Italy. There is a bitter prejudice against the majority of American dentists wherever I travelled, with very few exceptions. It was not shown towards me, as I was not looked upon as of that type, but as public property. In every country where I stopped over in any of the cities the receptions given me and attention paid and banquets tendered were seemingly most unselfishly done, and no prince could have had more attention. The effort seemed to be to show to the world that they were ready to receive *any dentist from any country, provided he would freely give of all he knew and demonstrate all his methods of practice.*

We have no reason to object and complain because American dentists are repulsed by the foreigners. The same thing is being done in every State of the United States to prevent our own citizens from practising.

In comparing the capabilities of dentists over the water, and their social standing, with such as we have here, I can say they are on the average far better educated and come from a higher social standard. At least, such as I met.

Very few of the dentists in foreign lands come from the lower walks of life. There is no reason why Americans should be better dentists, physicians, or professional men, except that we have a larger opportunity to develop talent, as the necessity for dental operations is greater than anywhere on earth, and we have a richer people, and the teeth are now better cared for here. Besides, gold is not so much used there as here; plastics have the preference. Prices are not so high, and the patients are more afraid of being hurt. I had a better opportunity, perhaps, of seeing the operations wherever I went than had any other one who ever travelled. I was brought into more immediate contact with the very best elements of professional men, and I can say for them, everywhere, that a more gentlemanly set of men I never met, and never once did I feel any discourtesy, everything being done to make my tour one long to be remembered, with love and attentions from all quarters.

I gave no talks or clinics in Italy. Entered no schools and but few offices, owing to the extreme heat and many dentists being out of town. It was not until I reached Leipsic that I began to realize that I was about to enter upon the course of lectures and clinics promised them through the notices of my intended visit given in

the INTERNATIONAL DENTAL JOURNAL and *Items of Interest*. At Leipsic I felt at home. My old student, Dr. Paul Schwarz, and Professor Hesse, of the Dental Department of the University of Leipsic, tendered me every facility to see their school and private practice. As the school was about closing, I had no chance of seeing their methods of teaching and demonstrating, yet I saw enough to satisfy me that to do the right thing by the students they must have better and well-equipped quarters. The school was small, and really their work was more a labor of love, as they could not expect to have large classes with the Berlin school only a three hours' ride from Leipsic.

At Berlin I had been specially invited, before leaving, to meet the Saxony dentists and the Society of Dentists of Central Germany, on the 6th and 7th of August. It was here my first clinic and lecture were given, and for two days my time was fully taken up. Very few clinics were given by the members of the Society. The papers I could not hear, and cannot report upon their value. They were a fine-looking set of men and evidently well educated.

As usual with them, as with us, a banquet came off, and they spared no expense, champagne being the principal beverage for all. They seemed to act harmoniously, and, aside from the banquet after the close of each day's session, a social time was had. They certainly do enjoy themselves and endeavored to have others do so.

Professor Miller was at the meeting, but was unable to take part, and left before the meeting adjourned. He seemed to be in a very precarious condition, evidently from overwork.

I visited several offices in Berlin and the University School, where they have about two hundred students. Professor Miller has not been able to be of much assistance at the school for months. The school was not in session, and of course I saw but little of their methods of teaching.

When in Berlin I called upon Professor Miller, but his physical condition was not such as to warrant a prolonged interview. He, however, asked me to call upon his assistant operator, who would show me his offices and his efforts at carrying out his teachings.

I accepted this invitation, and while I saw some of his patients, yet I found no inducement to change my own simple ways of treatment, which for forty-four years have been satisfactory, notwithstanding all that has been said on the germ theory.

My methods were based upon my father's practice as a medical surgeon, whose teachings and work I had ample chance to observe,

until my advent into dentistry in 1854. These were cleanliness, thoroughness, with constant watchfulness to keep down irritation, and, if inflammation followed, to meet each advance and anticipate its ending. With it all he taught me boldness and daring, and to see that all directions were faithfully carried out. The remedies were confined to wood creosote, nitrate of silver, the bistoury, saws, forceps, free incisions, perfect drainage, all deep sacs well opened to inspection; the evacuation of all matter in stomach and bowels, the drainage of the whole intestinal canal by distilled spring water, and the best of food in small quantities, thoroughly masticated without drinks; and, not least of all, water at its various temperatures as an application on all unbroken surfaces; and by all means to see that the hands and finger-nails were clean and well trimmed, and that the instruments to be used be scrutinized, and to have them sharp, as well as free from rust and stain. To this may be added rest and quiet; no meddling with the parts once treated, if doing well; operating with rapidity and as little exposure to the air as possible; binding up wounds in their own blood, first washing with almost scalding water, and to take every precaution against infectious diseases, particularly erysipelatous inflammation, and not to put his own hands on his own person anywhere or allow the patient to touch the parts; the airing of the sick chamber, and permitting no slops to remain. He, in other words, taught me to be conscientious at every step, to not do nor overdo, and nothing more exemplified his treatment than the care he exercised when acting as an *accoucheur*. Now, what more did I see in all my travels to convince me that mortal could do more than follow out these early lessons? And yet I would not decry the work of any who may wish to dive deeply into the germ theory, nor check their investigations. Professor Miller's associate said they were doing no more than these rules I have stated, nor could any one.

One thing I saw wherever I went in Europe, to which I seriously objected. The stationary washstand, with reservoir for cold water alone, and a tub for waste inside, cannot be clean in any sense of the term. Better to have a bowl and pitcher and slop-jar of porcelain on top and in sight. These never can be detected by the finest olfactory senses. While these stands are artistically made, yet if pure asepsis is to be the fad, then those who have earned a reputation through its advocacy should live up to it and thus avoid criticism.

I was thanked for calling attention to this matter. It may not be too late in the day to place this on record as worthy of care-

ful consideration, to enable us to practise somewhat nearer to the ideal direction of bacteriology; and, if we want to be true and pure followers of asepsis, then we should have our floors, walls, ceiling, and tiling of such character that nothing can accumulate. We should wash our dental engine hand-piece every time we shift from a diseased tooth to a healthy one, and, in fact, wash our hands when we remove them from the mouth each time, and never fail to do this should we step aside for a moment to shake hands, handle coin or bank notes, or go into an adjoining room. Everything should be changed,—linen on the head-rest, linen coats, napkins for the mouth,—and a hundred other things must be done to doubly insure against poisoning from any source. Without all this, no one does practise that which he preaches as indispensable. I bow respectfully to all investigations, yet there is such a thing as overstepping the bounds of experience and clinical practice, long since in custom among all clean and conscientious surgeons and dentists.

In justification of this stand taken, there will be found, farther on, the report of a clinic given by me in June, 1897, before the Stomatological Section of the American Medical Association in Philadelphia, to show the value of the clinic over hypothesis, theory, and speculation.

Science is now the dominant fad,—science arrayed against experience and clinical life, and marshalled by a set of men the bulk of whom have no genius for dentistry, and who suppose they can swim with the current started by great thinkers and workers. Such men are not to be followed. I have called attention to the dental school at Moscow as coming nearer the ideal of treatment, as regards rooms and surroundings and the individual wash-bowl of hydrant hot and cold water. I found these at the Guy's Hospital dental school, in front of every chair, compelling the student to be ever on his guard in the presence of the patient. More could not well be done to secure immunity. This once engrafted upon the beginner, all else would follow to secure more perfect surgical work in our profession.¹

In enlarging upon this let it be understood it is not done in a spirit of criticism and want of regard for the work done in bacteriology, for no one has a higher appreciation of what is being done

¹ In a short biographical sketch of Sir Joseph Lister in *Popular Science Monthly*, it will be seen how many changes he made from his initiative treatment and what he now claims to be all that is needed over the all-important, vital axiom,—cleanliness first and thoroughness.

by others outside of my own special work; nor do I wish to have others feel that I do not believe in the application of science to dentistry. No! but from my own practice and all I saw in Europe, whether in hospitals or private practice, or clinics given in both medical and dental hospitals, and the talk on this subject at all the gatherings, I cannot endorse the extravagant directions given for our following.

To show still further that no injustice can come from my talk on antiseptis, I must be permitted to speak of a clinic I gave in Philadelphia, June 8, 1897, before the Dental Section of the American Medical Association. I introduced fifty patients, commencing with the first one for whom I ever practised, showing the result of a mixed action of conservative methods in gold, tin, amalgam, and sectional plates; in fact, as I said, my whole practice was summed up in this clinic, in order to have it criticised in the broadest and to the deepest extent possible by the committee.

Their report was at once given to the main body that the clinic was unique, and without exception the boldest effort ever given in dentistry to exhibit the principle which should actuate every one in freely presenting his work for the criticism of a committee. They did not take exceptions to a single point offered, and thanked me for the privilege given.

If a mechanical invention can be considered to have any aseptic effect in surgery, then I must add to this list that which has already proved the most important adjunct in surgery, next to anæsthetics, if one can believe what Garretson has said of it: "The surgical engine stands next to anæsthetics as the *greatest boon given from dentistry to the world.*" With this instrument alone almost, wounds do heal by the first intention from the perfect freedom from spicula, and saving of time and shock.

In introducing this instrument, I know, from personal experience with both the elder and junior Gross in the Jefferson Medical College Hospital, that the operations I performed in bone surgery, without special aseptic treatment, were perfectly successful; when, if done by hand surgery, Professor Gross admitted to me they could not have been done without erysipelatous inflammation following, and the cure prolonged and probably loss of much bone structure. This engine stands as evidence of how much can be accomplished by machinery irrespective of aseptic treatment.

While I was shown true courtesy from every one, yet it was with difficulty that patients could be seen. This was perhaps not on account of the fears of the operator, but because the patient objected.

In many cases, however, they yielded, when they were told I was an American dentist, and they wanted to show me what could be accomplished in Europe rivalling America; and that, while I was freely giving my time, labor, and love in this mission, it was but fair to reciprocate. I was amply repaid for my visit to Berlin to know that after all the arduous work and research of bacteriologists I was as near to the high-water-mark of success in saving human teeth without practising all the so-called science of bacteriology to assist me. The work performed is futile when it comes to be put into practical use, and especially in the hands of poor operators, as it gives them an excuse for covering up imperfectly performed operations; and, unless an operator is very conscientious, he will become less efficient in mechanical skill and dexterity.

I would not have you understand that I am opposed to the antiseptic treatment and do not carry it out in my practice. I do, but on an entirely different basis. It is well it has been so thoroughly ventilated, for dirt, at one time, ruled the hour in too many dental offices; although, as a class, I think dentists are now more cleanly in their habits.

I have seen so much of asepsis that when applied in cases where immediate action in surgery is demanded, it fails. Tait, a celebrated English surgeon, proved, by his statistics of operation, that he had performed, without any special aseptic treatment in advance, or at the time of the operation, a greater success than Lister with his carbolic spray.

I witnessed an operation upon my own daughter, where two skilful surgeons had diagnosed a tumor of recurrent type, and advised immediate action. The rooms had been cleared of all unnecessary furniture and carpets, walls washed, floors scrubbed, and all the linen and paraphernalia made aseptic, with every precaution for her safety. The case, I was satisfied, and so told the surgeons, as well as my children, was an abscess of strumous character and situated deep down in the axilla, left side, and that the mammary gland was not involved at all. They persisted in first removing the breast, and found no tumor, and then went on the search for it in the axilla, when, to their surprise, an abscess spurted out into the operator's face and all over the wound, spreading the poisonous pus into every tissue, so much so that it was impossible to clean the wound satisfactorily, and it was bandaged up in a doubtful condition; but in spite of all this the wound healed without untoward consequences.

Hundreds of operations are done without any previous treat-

ment and waiting, without any of the means at hand to practise thorough asepsis, and the results are good.

At the American Medical Association meeting at San Francisco, in 1894, an M.D. was exploiting his methods in preparing himself for a case where he was called in hastily to see a woman who was flooding to death. The time consumed was about fifteen minutes before he touched the woman.

A woman M.D. saw a point she could make, and rose to tell her treatment. She said, "I would have rushed into the kitchen, called for soft soap, gone to the hydrant of hot water, and would in three minutes have had my hands perfectly clean and been at my patient's side and saved the risk to her life by the process adopted by the gentleman who has just spoken."

In many places, not only in Europe but in America, have I seen the operators with a woollen coat on in their offices which they had worn for every patient for days and weeks, worn it on the street and wherever they went, while they had tanks of carbolized water as well as bichloride of mercury around the chair to show off their great care for the patient.

While it is all well to preach and attempt to carry out iron-clad rules, yet there is no treatment that will insure success where the system of the patient is not up to a healthy standard and the operation has not been thoroughly performed, and with scrupulous general cleanliness.

With all the application of it to the treatment of pulp canals, the cry is still for further advance. Few succeed.

As early as 1855 my only medicine in pulp treatment, whether after a live pulp had been removed or in a case of pus formation or an abscess, was wood creosote, and with cotton or zephyr in the canal, after thorough extirpation and rigid cleanliness, and the immediate stopping of the canal and letting it alone. I have no cause to regret that cotton was used or that creosote was my only remedy. No one can show better success and a greater number of human teeth preserved without pulp exposure, or after exposure, from this simple treatment.

Antiseptic treatment has done a wonderful work, and all praise to the agitators! But let us not lose sight of the fact that with it all our operations in the various branches of our art would not be worth a farthing without mechanical engineering details are carried out faithfully, and certain physical obstructions are removed and *all stagnation is displaced.*

In Vienna and Venice our stay was so short that, further than sightseeing, no dental experience was had. It was not until Mos-

cow was reached, the objective point of our trip, that life began to take on the phase of hard work.

I cannot pretend to describe to you the old city of Moscow, with its long and interesting history, nor can I give you what I saw at the International Medical Congress, as my time was consumed in the work laid out in the clinics, which very wisely was planned to get the most good from the meeting, as the reading of the papers alone would not have taught much without clinics. To begin with, it was the dirtiest city I think I ever visited, and yet the dwellings and public edifices inside are marvels of cleanliness.

The Dental School in Moscow was managed by private dentists, and it was here our clinics were held, and I can say for it that I never saw handsomer rooms and a school where asepsis came nearer to being accomplished, so far as the buildings and equipments were concerned, combined with clean operators.

The faculty were fine-looking men from the front ranks of society. But few, if any, enter the dental schools from the lower grades. There are but two grades, the high and the low, and, of course, the men who enter any of the learned professions come from the higher. There is no middle class. Hence the men who are found in dentistry in Russia must be better educated and adapted for their work.

There was one dental school in Moscow. In Warsaw there was a dental college and with much larger classes, numbering two hundred students. That in Moscow had but eighty students. The sessions had closed for the summer. In Warsaw I did not get a chance to even peep into their college building, although I afterwards met the Dean and his son at the Congress, whom I found men of character and evident ability, and who spoke the English language fluently, as did many Russian dentists at the Congress.

Four hours each day for four days were given up to the clinics, and, as I said before, it was a comfort and a pleasure to operate in the palatial rooms of this dental school.

As to what was done by others I could not tell you, as not a moment was given me to look around at the work of others. My countrymen, Drs. Younger and Talbot, read papers; and I think Dr. Younger showed his practice in pyorrhœa and perhaps a case of implantation. Talbot talked about etiology and degeneration and visiting hospitals.

There were many devices shown and methods of practice from dentists in Europe, but withal I cannot recall anything new of any value. My special attention was called to this later on, after clinics.

The clinics were crowded every day, and attention was held without abatement, giving apparently more satisfaction to see work done than to hear it talked about.

My own clinics were in the mouths of living patients. Four hours a day for four days and constant talk all day.

Abbey's cohesive and old-fashioned gold-foil were used with electric and mechanical mallets. Abbey's soft foil was shown to be capable of being impacted solidly and perfectly with smooth points only, yet it was easily done by hand-pressure. It was shown to have softer qualities than any other foil, and would save tooth structure without recurrence of decay.

My second clinic was with amalgam, showing the new matrix made of a rubber dam clamp and modelling wax or gutta-percha, and how all of the mercury can be absorbed from the hardest filling made under the pressure of bibulous paper by rubbing into the surface of each filling, before the matrix is removed, the chips of amalgam until no more can be rubbed in. Also, how gutta-percha can be used for matrix for gold filling.

I gave an oxyphosphate clinic, and explained how paraffin saves it from destruction. A clinic also on the many and vast uses of gutta-percha, and also a clinic on new method of bridging, with clasps and made removable, as well as bridging permanently without gold caps. I gave them a synopsis of clinics and methods (to be published elsewhere, and in the proceedings of the Congress).

It would take too long to enumerate all that was done to fill the hours completely each day. They had become enthused over gold caps and bridges, cataphoresis being hailed with delight, and while it had not been largely used, yet it was soon to be tried, and I gave them my paper on it.

I had an opportunity of seeing into the mouths of many persons at the clinics, and invariably decay had exhibited its ravages as thoroughly as I had witnessed it in cases in my own practice. Not only in Russia, but in every country, degeneracy looms up wherever civilization has stepped its foot, and there is no greater mark of failure of life in its physical aspect than the prevalence of caries among all classes. Luxury has had its effect upon every nation.

As I before stated, so constantly was my time engaged that I had little chance of seeing the clinics of others. Out of seven thousand delegates not more than two hundred were at the meetings of the Dental Section; and, judging from the badges, not many were delegates from organized societies. From the pen of a Rus-

sian, writing upon the status of dentistry in that country to the *British Journal of Dental Science*, I would read you some extracts if time permitted.

The general Congress was no doubt a success in all its departments, yet no marked treatment or advance was brought forth. There was a surfeit of papers and many that were only read by title. The Surgical Section particularly was the most active, and it was into this that our Dental Section was merged, which gave it more character, although our work was entirely distinct from all others.

I cannot close my remarks about the Congress without a word to show you how well our Dental Section was treated. Aside from having our proceedings to ourselves, as all the other sections had, when it came to the grand banquet on Friday evening the Dental Section was as highly honored as any other section, having its table in the midst of the medical men from all over the world. At the table just back of me sat the ex-President of the American Medical Association, Professor Senn, from Chicago, with several medical gentlemen from America and elsewhere, and he can tell you whether the men at our table contrasted favorably with the others and how they treated your essayist to show they were not unmindful of the advances made in dentistry as fully equal to any made by the medical profession, and that they were proud to do justice to America and make this banqueting season an occasion when they could demonstrate their interest in the representative from your country. I felt it a great privilege to have been present on that occasion.

That you may know how the Americans were treated at the International Congress, I have here a letter to me from Professor Nicholas Senn of Chicago, the President of the last American Medical Association which met in Philadelphia in June last, who went over on the same steamer to attend the Congress. Inasmuch as I was a delegate from this society, as well as from the American Medical Association, I can be pardoned for showing Professor Senn's letter.

Aside from the honors spoken of here, many diplomas of honor have been sent me since my return.

The French School of Dentistry and the French Dental Society gave me a very large and handsome silver medal, while the Dutch Dental Society also gave me, at the close of my clinic at Amsterdam, a portfolio of thirty photogravures of this quaint old country, measuring two or three feet.

When I stopped and gave clinics and talks, some memento was given to remind one of the love that exists everywhere for a fellow-dentist who will unselfishly go to a clinic and teach all he may know.

While I was not in Spain, yet it was my good fortune to have the almost constant society and attention of my friend, Dr. Aguilar, of Cadiz. Speaking, as he does, several languages, made my work far more effective; and having been a great traveller himself, he, in reality, was my guide from Berlin to Moscow, and on my return to Hamburg. He is fully alive to the wants of our profession, and is to be found wherever any great meeting is in progress. He was sent as a special delegate from the Spanish government.

It would be impossible to speak personally of the men who left nothing undone wheresoever my pilgrimage took me. To feel a lasting debt of brotherly love ever welling up within me is all that can be returned to repay the debt until they come to America, or I can contrive something to aid them in their work.

This manly letter of Professor Senn will sink their stupid selfishness to honor their own men :

"582 DEARBORN AVENUE,
"CHICAGO, February 25, 1897.

"MY DEAR DOCTOR BONWILL,—Permit me at this late date to congratulate you on the recognition you received in all parts of Europe on your trip to the International Congress last year. It is a source of pride to me that so many honors were conferred upon a well-deserving American delegate. I thought I worked hard, but I have found more than a counterpart in you.

"Hoping that your life and health may be spared for a long time for the benefit of science and humanity, I am most sincerely your friend and admirer,

"NICHOLAS SENN."

"582 DEARBORN AVENUE,
"CHICAGO, March 13, 1898.

"DEAR DOCTOR BONWILL,—Many thanks for your very appreciative letter. I am sure in saying what I did I only voiced the sentiments of the whole Medical Profession. Next time you are in Chicago, I must see more of you. It will please you to know that the patient upon whom you saw me perform a very difficult operation for cancer had no unpleasant sequela.

"I do hope I will meet you in Denver.

"Very sincerely yours,
"NICHOLAS SENN."

It was a mark of the nobility of Professor Senn to voluntarily pay me such a compliment as a medical man to a dental delegate, when it could have been a cause for deep jealousy against our Dental Section at the Congress or at the American Medical Association meeting. I am sure dentists at home can well feel com-

plimented at the letters of recognition coming, as they do, from so high an authority.

This is also in marked contrast with the action of the four honorary presidents at the Berlin Congress, where I was specially invited to read an article on Articulation. These men informed me I must not go to the Congress in 1891, or they would make it very unpleasant for me if I did go. I remained at home and waited my opportunity, which came at the Congress at Moscow, and, instead of dishonoring my profession, I am sure they cannot complain at the honors given through me to them. If the dental profession here want to gain the highest recognition by the medical fraternity in their Congress, they must learn to respect and honor and uphold their own men, and not exhibit petty jealousy towards those whom the world acknowledges have done something for progress. I can afford to pardon such work, as I have always known opposition from the first; yet, as all things come to him who waits and labors, so I have tried to do, and I am none the weaker from that course. I hope yet to do what will always help my calling to rise above itself and its own follies. My love for it buoys me above all opposition to drive on.

The following letter from a Moscow delegate will speak for itself:

"OFFICE OF 'PACIFIC MEDICAL JOURNAL,'
"SAN FRANCISCO, CAL., April 15, 1898.

"DR. W. G. A. BONWILL, 2009 Chestnut Street, Philadelphia, Pa. :

"DEAR DOCTOR BONWILL,—Ever since the receipt of your kind letter of the 11th of January, I have hoped that within a few days I should be able to write to you about my talk before the Dental Society. For one reason or another something has intervened to prevent my appearing before this Society. The time has at last come, however, when I can tell you definitely what I am expecting to do. I have received an official invitation from the California State Dental Association to give an address at their next annual meeting in June. I have accepted the invitation and propose to make you and your work the chief subjects of my paper.

"One week from next Tuesday I shall, also by invitation, give a short preliminary talk to the local Dental Society. Last month at a banquet given to Dr. Brophy of Chicago, Dr. Barrett of Buffalo, and Dr. Hoff of Ann Arbor, I was invited to say a few words. I improved the opportunity, in speaking of American Dentistry, to call up your name. I told these gentlemen that in the reception accorded you in Moscow and other cities of Europe, American dentists were highly honored, that through you a high tribute was paid American dentistry.

"I take every opportunity to bring your name forward, as I feel that it was through my acquaintance with you and hearing you talk about dentistry that I for the first time realized the tremendous advance made in the science of den-

tistry during the past twenty or thirty years. I became convinced that the science of dentistry is as much a part of medicine as is ophthalmology, otology, or the special study of any other part or parts of the human economy. They are co-equal and cannot be considered solely as organs having no connection with the rest of the organism. I take pleasure in dwelling upon this idea that the doctor in medicine and the doctor in dentistry are making towards the same end,—viz., the conservation of health. It is not necessary for any of us to make a point on the superiority of one branch of medicine over another. To my mind it does not exist. Our only reason for devoting our lives to a single branch of medicine is due to the limitation of human knowledge and our inability to master the whole range of medicine. I propose in my address to develop somewhat a few of these ideas.

"Very sincerely yours,
"W. F. SOUTHARD."

At St. Petersburg I was met by the dentist to the Czar, Dr. Wollaston, an American from Pittsfield, Mass., who insisted on my remaining several days, when he would show me the wonders of that modern city and perhaps get me a glimpse of the Czar; but I had to forego this pleasure and hasten to Copenhagen. The time was so limited after the Congress that while I was telegraphed to go to Christiana and Gottenburg to meet the dentists of Norway and Sweden, with the proffer of a good time, yet I had to rush on to Stockholm, where so many of the dentists spoke English fluently and made my visit far more agreeable, although I did not want for interpreters wherever I went. Dr. Aguilar, of Spain, was almost constantly with me. I had the advantage, however, of being able to clinic, and that would have conveyed a language unmistakably plain.

The dentists of Stockholm were markedly attentive, and threw everything aside to make my stay pleasant and profitable. They were a wide-awake set of men, and their social position was such as to make their profession worthy of their following. They were well educated and with a live dental society and dental rooms, where, as a club, they could enjoy life after their labors. Their museum and library were full; I saw many handsome offices, and their homes showed a refinement that dentists should everywhere strive to obtain.

Their annual fair was under way, and I was escorted there several times, and twice a dinner was given me on the grounds. This fair gave the best of evidence of the ingenuity of the Swedes. It was made up almost exclusively of the productions of the natives, and you can imagine that with the advantage of such a school every year, and the high character of the Swedish people,

much must be expected from the native dentists, and that they could well do without American operators to help them. From what I saw there, I could well feel that here were men worthy of our admiration, and such talent should not be intruded upon, as they are well able to look out for themselves and their countrymen in our professional work.

When one goes into such life, he feels the good honest influence that is being constantly exerted by the people everywhere and that dentistry has good cause to feel honored by men who were true to their calling, true to each other, and true to one from across the sea.

At Copenhagen was held a repetition of clinics, talks, lectures, dinners, and social attentions.

The native dentists are a band of brothers, although in every city I found contending parties and cliques. It was enough for me, however, to see their offices, instruments, surroundings, and to hear them talk, to judge of their capability. No new method of practice was revealed, yet they were fully abreast in the treatment as given by us and others in the text-books. Here, as everywhere I went, the cry was for some plastic for filling, and for some method to prevent recurrence of caries, and a plan that could be followed that would insure what had been done by the operators against the ravages of time. No form of gold had been found that would fill the demand, nor had any plastic, and they were ever ready to hail with delight any one who would offer anything equal to the demands of the hour, and for those who desired to honorably practise dentistry.

Here, as in quite all of Europe, they are handicapped by low prices, and when I tell of my visit to Dr. Herbst at Bremen, I will show, from his experience in the manufacture of submarine gold-foil, the true condition of affairs all over Europe.

The Copenhagen dentists show that they practise a profession with love and a desire to leave nothing unknown that will aid them; and, above all else, they are so acting that the social status shall rank as high as that of the surgeons. I shall ever feel proud to shake such men by the hand when they come to America.

You must know that it is no trifling effort for a man of sixty-four to lug all his traps around in a dress-suit case heavy enough for a galley slave, and unpack and pack up after each clinic, and talk incessantly for three months. But clinics pleased them everywhere more than anything else, and the effort is always appreciated and draws crowds that no lecture will. It was a labor not for myself, but to honor my Society and the American Medical So-

ciety; and whether you say, "Well done, faithful servant," or not, I have performed a duty for which home recognition offers least remuneration.

After such recognition I was loath to leave, although I needed rest, which was now to come for a few hours in the enchanting steamer that was to carry our Cook medical party to Hamburg, where at last I had to bid adieu to them after the long tour from Gibraltar all through Europe. But many of them I have met since, and memory will ever cherish associations thus made, and which are the more refreshing and lasting as time passes.

At Hamburg a delegation met me at the cars who had long ago extended a special invitation while I was at Berlin. The same routine of talk and clinic was repeated. Social attention here was a marked feature, and the bowl was always brimming full, and warm feelings overflowing at the home of every one where I was invited. The live questions were brought up for discussion, and deference was paid to your delegate and attention given his efforts to instruct.

It was here that a gentleman of wealth gave fifty thousand dollars to the city to establish a dental infirmary for the benefit of the worthy poor, and eight thousand dollars extra yearly to keep up the expenses and to pay several operators a salary that good services could be had. This was an institution worthy the pride of any city.

It was at the suggestion of one of the Stockholm dentists that it was founded. The dentist asked the wealthy donor for ten thousand dollars, and he told him that was not enough, and at once gave him fifty thousand dollars to have a building put up that would meet every requirement. He had made it a model in every way and a most worthy benefaction.

I met with no set of dentists who gave so much evidence of brotherhood and hand-to-hand work for the elevation and promotion of their art.

Let me say here, that there was no one thing upon which I held forth to instruct that gave them apparently more pleasure in the knowledge acquired than the laws of articulation. I was made to show up this part of my teaching more than all else at every point where I stopped over, and, be it said to their credit, they absorbed it more perfectly than the American dentists at home had done in thirty-six years, and for a very good reason: that more of them are academically taught in polytechnic schools than the bulk of the profession in America. But what I wanted so much to see was deprived me. Few of the operations performed by them

were shown me. They could tell their desires and wherein they had failed, and their longings for higher and more general knowledge.

What I have told you of all other places answers well for Hamburg. With a view of their magnificent harbor and their appreciation extended I passed over to Bremen to see my old friend, Dr. Herbst. He had sent me a special invitation before I left America to be his guest on my return from Moscow. He surely gave me a warm reception and one that was in response to the manner in which we all treated him while in America several years ago, when it will be recalled he was brought by his personal friend, Dr. Bödecker, to show me the rotation method of filling the teeth with gold. He had much to show me, but what was now uppermost in his love was submarine gold.

While he still uses rotation, yet he has not the necessity for it as formerly. He showed me a great many cases in his practice previously done with submarine gold, as well as how he manipulated it and where he used it. It is a gold he is manufacturing, and of which, he informed me, he had sold much in Europe, but none in America, and wanted me to interest myself in his behalf in this country.

For what purpose has he prepared this? What are its virtues and peculiarities? What his method of insertion? et cetera. I asked him what excuse he could offer for such treatment. Did he consider it good practice to teach men submarine work instead of instructing them to keep the gold dry? It was sufficient for me to see him manipulate it by hand, and then with the burnisher in engine. First, he made no pretension to giving the cavities the proper shape to prevent recurrence of caries; used a matrix of peculiar design of his own, which he hastily placed on, never using the rubber dam; taking no precautions to keep the cavity from becoming submerged or to have the gold remain dry; in fact, he exulted in calling it submarine.

All compound cavities he converts into one of four walls. The gold is used in the form of cylinders and carried from the bottom, overlapping the walls and wedging in finally from the centre, and then compressing as in the old style of soft gold and hand-pressure of fifty years ago. Many of the operations I saw him perform he could have easily kept dry; but no, it must be submarine.

I told him there was nothing new about introducing gold under saliva or water. There were several fillings in my own mouth, put in by me forty-two years ago with Abbey's soft foil, that I could not keep dry for a moment, and which are still doing service. I

told him of a clinic I saw Professor Peirce perform before his class, injecting water in the cavity all the time. But while it can be done, and substantially so in many cases, yet it will never do to teach men this thing, as it would soon render them incapacitated for any fine operations, and make of them sluggish and very indifferent operators. I was frank to say to him that he was doing a wrong thing to his patients and the profession and himself. On every approximal wall and space the food would crowd in, and there was sure to be a recurrence of caries. In no instance could he make a contour, and never any wide interproximal spaces such as I make in plus contouring, and it would be impossible to call such operations saving ones. I asked him what excuse he could give. "Well," he said, "in Germany we cannot get more than from two dollars to four dollars at most for gold fillings, and for amalgam one dollar to two dollars," and as he could not afford to practise for such prices, he was compelled to put in as many gold fillings as he could with this submarine gold in order to meet the expenses of his establishment. Besides, he claimed that it should be adopted by every one, and it was being used by some of the best European dentists, since it overcame so much preparation for cohesive foil and did away with the rubber dam; and also gave his rotation method another chance for extended life; and, withal, helped to do away with amalgam, gave assistance in making more revenue and labor not so great, and more patients were benefited for a short time and without pain. He certainly felt all he said, and gave me his gold to try.

All these excuses or palliations in practice could not turn me away from what forty-three years had told me was wrong *in toto*. Yet there are cases that come to me where gold would seem indicated from position only, and where once I placed it in wet; but I will no longer do so, as we have other materials now at our disposal. It can surely be reached in the use of amalgam in all teeth posterior to the cuspid, whether wet or dry, and the success attained will show that it is impossible to tell whether it was placed in wet or dry.

I begged him (Herbst) to relinquish his idea, for such a practice would not be recognized in America among the best of men, and his reputation would be smirched and his prospects in the near future injured, for it would not pay in standing or financial results. He was dead set against amalgam, and seldom used it, not for want of valuation, but, as I said, because there was so little profit in it.

His courtesy and that of his family I cannot forget, and his

efforts in having me for four or five days at his office was generous and kind, considering how few dentists would allow any one to enter before a patient. I was pleased to learn in many ways that his ingenuity as a dentist was appreciated by the city, although he has his strong opponents and his rotation method is not generally used in Europe. He is a hard worker and a worthy man, and he has the talent to practise our profession if only centred and balanced in the right methods to be adopted. He could do it, as he is not only a mechanician, but good at improvising, enabling him to overcome difficulties that confront every one of us.

Dentistry can never rise in any country where prices are, as here, kept at the "low-water-mark." A dentist "is a man for a' that," and must feel he is paid for his brains, or he will finally become a mere tool.

I saw very little of the dentists of Bremen, as my visit was consumed quite wholly with Dr. Herbst. I did visit several there, but, aside from seeing their offices, gained nothing from their patients.

I regret that I have felt obliged thus to criticise, for I estimate the man. With a hearty shake of his hand, after having our photograph taken together, at his request, by a woman artist (a good one she was), which I present you here, my mission was now to proceed to Amsterdam, which was somewhat out of direct line to Paris.

It was in quaint old Amsterdam where the wind-mill rears its head on the broad plains where the winds have such a fair sweep. Dr. John E. Grever, the President of the Dutch Dental Society, had written me in advance of my arrival at Milan, Italy, and at Berlin the Society was represented. He was also delegated to give me a pressing invitation on my return from Moscow, and while there the day was appointed when I would surely be present. It was upon a Sunday, and dentists from all parts of Holland came for the special occasion. From eleven A.M. until five P.M. it was one continuous talk and demonstration, and their attention was certainly unique and most gratifying and stimulating to your delegate, who was beginning to feel it was time to hold up. Dr. Grever speaks English fluently, as do also all the Dutch dentists, and his assistance and attention was so courteous and full that my labors were far less than they otherwise would have been. It was at his house I was entertained for over a week, which gave me a chance of seeing more of his patients and his work than almost anywhere I had been, and it was gratifying to me, because all that

I saw of him and his practice evidenced conscientiousness in what he was doing.

His zeal was such that he was anxious to have the Dutch boys and girls see an American, since he had several times met me at home and in Europe, and as their President he had certainly exercised himself to get up this meeting.

I cannot pass on without mentioning that six or more young lady dentists were present, and, to their credit be it said, they were most favorably looked upon by the men of Holland. They were surely a handsome set of women, and showed the intelligence in their faces that marked their qualities of character and ability.

One in particular was the handsomest woman I had met abroad, and on visiting her afterwards at her home in the Hague I found she was highly educated, spoke several languages, was a fine mechanic, well posted, so far as I could quiz her, in every branch of our art, and practised with an enthusiasm no man could excel, and anxious still to learn how others practised. She was educated by her father, whose social position (and as a teacher of languages and belles-letters in a college near her in Holland) showed it had not been lost upon her. The day and evening I was in her offices I saw many of her patients, and can speak well for her future. One thing made her practice unique,—she would not practise for men, only for women and girl children. I told her she had good sense, and she would be most likely to keep a high reputation and have plenty to do. I gave her an invitation to visit America, and I would give her three months, if she wished, by my chair, feeling that such a woman dentist was well worthy my attention and commendation, for she was certainly well equipped in every way, and, withal, in four years had a practice of four thousand dollars, running her own establishment and educating her brother in dentistry, who would be sent to America for his finishing touches and finally to be her associate. I did not get a chance to visit the offices of many dentists at Amsterdam, on account of sight-seeing and, in addition, a clinic before the surgeons and staff of the university there with the surgical engine.

As to the beauties of this old city, I cannot speak here, but simply say no city in Europe pleased me more, and I left without seeing much of the life, the scenery, or its institutions. The time was quite all devoted to the dentists. To do justice to this one place, and my impression of the dentists of Holland, would consume many pages of paper.

The banquet given me after this Sunday meeting was certainly

gratifying and gorgeous, and a fitting conclusion to that long day of labor and love. My friend, Dr. Grever, thought he would please me beyond degree by having one of my articulations carved from a huge turnip brought in on the dish of ice cream dessert. It was very nice in him and not to be supposed that the bloodless turnip was to represent the true value of my pet invention. While I rather hesitated to go out of my way to visit Holland, after so long a tour and needing absolute rest, yet it was a red-letter week, and if I only did enough for them to pay for the attention received from them I shall be content that I did not pass them by.

With reluctance, I now bade adieu, to speed on to Paris.

(To be continued.)

PATENTS *VERSUS* NO PATENTS.

BY DR. G. ALDEN MILLS, NEW YORK.

At the meeting of the New York Institute of Stomatology, Dr. St. John Roosa stated that medical men say that dentists have no code of ethics. Of course, such a charge will irritate many of a certain kind. We all know that a man in temper is weak, and in that proportion his influence is lost.

When self interest most predominates the written code may seem to hold men to ethical conduct, but there are a multitude of tricks that can be resorted to that would manifest anything but an ethical character.

Another statement Dr. Roosa made at this meeting, which has great weight, is that the medical profession has kept absolutely free from the taking out of patients, and that it has not been debarred from all the benefits that have been devised for its advantage and for the amelioration of the ills of humanity. Have not the members of this profession gained as much in value by a professional *esprit du corps* as our profession by the opposite course? Have we not placed commerce against professional spirit? and, again, has the medical profession not gained as much? We cannot gainsay the fact that the members of this profession are far better established in the matter of fees than we are. The public regard them professionally in a far higher sense than they do us. They do not question them regarding the remedies they use, nor dictate as to what they shall prescribe. They do not solicit them for out-

side operations. The aim of the public is to get the benefit of their skill. The medical profession is not hounded by courts at law for the collection of royalties. We have seemingly been the creatures of misfortunes which date back to the Vulcanite Company. It is not necessary to repeat the history, it is too bitterly fastened upon the memory of those who suffered. The millions that were so mercilessly wrested from dentists stirred other agents of his Satanic Majesty to try and repeat the experiment, but they lost their crown and had all their bridges destroyed. No words of praise are too strong to express the gratitude that exists in the hearts of many regarding the labor and the results obtained by Dr. Crouse in our behalf. Such high-minded and unflinching purpose has its record in the annals of dentistry.

It is recorded that the "love of money is the root of all evil." This was quoted to a friend, and he rejected it and said, "It was not true," but, "God is true though all men be liars."

This brings us to the thought, may it not be that the inordinate love for getting has burdened our profession with barnacles of selfishness. It is not to be expected that a way will be devised that will liberate us as a whole, but it is believed it will result in a division of interest. There is an aim worthy of emulation directing to a higher professional standing in practice, which can only come through a larger mental grasp of what is true. Money is power, and this is showing itself in every direction in human affairs.

What has proved true in the medical profession without patents is that the public has a more exalted opinion of their worth, and so far as the dental profession gravitates towards the mercantile atmosphere will we be measured by the spirit of such an environment, and more and more will the professional spirit be lost. The mass of practitioners will gravitate to a business basis, and such a thing cannot be sustained on true professional grounds. There need not, however, be any warfare, simply drop those who prefer this course into the line of their own selection. There will continue to be a support for those who aim for high attainments, and to those will come the reward of appreciation. Skill for bodily comfort by remedial agencies in medicine and surgery cannot be placed in the scale of finance for adjustment. True professional practitioners will not be driven from the path of rectitude nor disturbed by the competition of business.

It is not true that the day has gone by for liberal fees, never was there a more favorable period for the reward of professional skill. We are coming to see this as never before. Through expe-

rience it has been a cause of wonder whether there could be a just recognition for faithful service, but the clouds are being dispelled by practical demonstrations. It is not possible for the writer to march with the croakers. The days, professionally, are no longer clouded by doubts. Having aimed for the highest the "patent" is not desired. "What have we that we have not received. Who maketh us to differ?"

Abstracts and Translations.

A NEW FACTOR IN EROSION.¹

BY ARTHUR S. UNDERWOOD, M.R.C.S., L.D.S.

THE accompanying photographs (Figs. 1 and 2) show under a very high magnification ($\times 750$ diameters) a phenomenon that has never been observed, so far as I am aware, and which throws some light upon the pathology of the form of tooth-wasting which is called erosion. In both sections (Figs. 1 and 2) an unquestionable interglobular space is shown; the calcospherites are extremely minute, but they are calcospherites, and they exist in human enamel. As yet no one has ever shown interglobular spaces in human enamel, although, no doubt, every student of Rainey and Ord who accepts their theories of calcification must suppose that imperfect enamel should contain these appearances.

Neither section was submitted to any reagent in the course of preparation; both were simply ground thin between two slabs of glass and mounted without any stain.

The patients from whom the specimens were obtained were both victims of very extreme and very typical erosion. The shiny grooves, sometimes with sharp edges, ran all over the surfaces of most of the teeth. Here and there caries might be seen running its own course, and in some sections I have stained the micro-organisms with methyl-violet to show the two forms of destruction in marked contrast.

I have never found these spaces except in enamel which was

¹ Being the substance of some remarks made during the discussion on Mr. Storer Bennett's paper on erosion at the Bath meeting.

subject to erosion. I have generally found it scattered through the whole of enamel which was so affected.

FIG. 1.

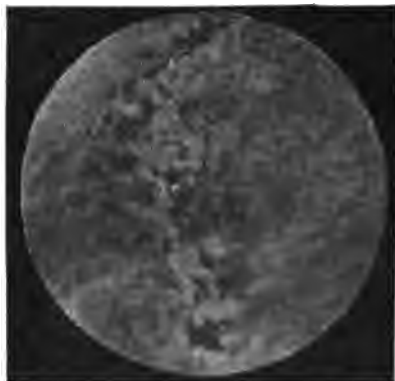
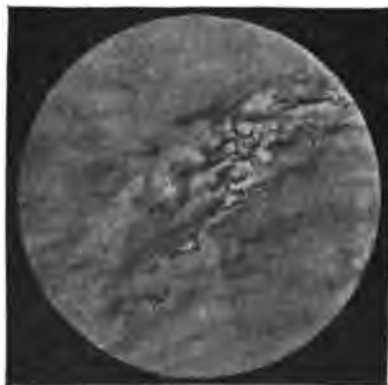


FIG. 2.



After considerable trouble I obtained, by the kindness of Professor Stewart, of the College of Surgeons, and of Mr. Smith Woodward and Sir W. Flower, some sections of the teeth of the sea-lion, which presented the well-known appearance figured by Dr. Murie in the *Odontological Society's Transactions* (1870). These do not show the spaces,—at least the appearances in the enamel which seem to suggest spaces are very doubtful, and I prefer to leave them out of the argument. Moreover, I do not myself perceive any resemblance to erosion in the change which wastes the teeth of the seal, the latter appearing much more like the result of

attrition of a purely mechanical kind, such as might be produced by the rolling of pebbles about in the mouth, a habit attributed to these animals.

I must add that I am indebted to Mr. Andrew Pringle for the perfection with which the sections are reproduced photographically.—*Journal of the British Dental Association.*

A SERIES OF FOUR CASES OF SWALLOWING ARTIFICIAL TEETH TREATED IN THE ROYAL SOUTHERN HOSPITAL, LIVERPOOL, DURING THE LAST SIX MONTHS.

BY JOHN OWEN, M.B.

THE following series of cases of swallowing artificial teeth may prove of interest:

CASE I.—William P., aged thirty, admitted to hospital at noon, March 20, 1898, complaining of having swallowed his false teeth during sleep twelve hours previously. He was suffering from dysphagia, aphonia, and slight dyspnoea.

On examination the pomum Adami was found slightly displaced to the right, and there was a fulness to the left of the larynx about the level of the cricoid. No foreign body could be felt by the introduction of the finger into the pharynx; œsophageal bougies could not be passed beyond the level of the larynx.

Extraction with forceps being deemed inadvisable, œsophagotomy was decided upon. The operation was easily and successfully carried out and the teeth extracted from their position at junction of pharynx and œsophagus without any difficulty. The edges of the œsophageal opening were brought together by two silk sutures. The wound was cleansed and the skin sutured, an opening being left for drainage at the most dependent part.

In spite of the most careful after-treatment the wound went wrong on the third day, and he eventually succumbed to septicæmia twelve days after the operation. The plate was unfortunately lost. It was made of metal and carried four teeth. The hooks were unbroken when the plate was extracted.

CASE II.—Charles H., aged fifty-six, admitted into hospital May 6, 1898, with similar history to above, but was unable to reach hospital until thirty-six hours after the accident. When first seen he was suffering from marked dysphagia and aphonia and

some slight dyspnoea. He was unable to swallow fluids and could not speak above a whisper.

Being a stout, thick-necked man there was no external appearances to indicate the position of the foreign body; it could, however, be felt by the tip of the finger down the pharynx.

An X-ray examination was made by Dr. Holland, the plate being seen on the screen. With considerable difficulty the plate was extracted by means of laryngeal forceps. The after-treatment consisted in keeping the bruised parts at rest and application of warm fomentations to the neck. His condition steadily improved during the subsequent forty-eight hours, the breathing becoming easier, with an entire absence of any signs of oedema of the glottis.

At this stage he for the first time complained of a sinking feeling, became restless, sat up in bed, and fell back dead in twenty minutes after the onset of this feeling of faintness. There was no post-mortem examination, but death was evidently due to syncope.

The man's appearance led to the assumption that fatty degeneration of the heart had a great deal to do with the fatal attack of syncope. The plate was made of metal, and carried six teeth.

CASE III.—James W., aged nineteen, admitted to hospital January 6, 1898, stating that he woke up in the morning with a pain in the throat and inability to swallow. He had retired the previous night wearing his false teeth, which he missed on awakening.

There was no external evidence of the situation of the plate, and no foreign body could be felt by the finger in the pharynx. A bougie was passed well beyond the level of the larynx before meeting with any resistance, and this resistance was without much difficulty suddenly overcome, the bougie now passing into the stomach. Immediately afterwards he was able to swallow. He was kept under observation for a month, during which time he showed no untoward symptom and did not pass the plate.

On making inquiries from his medical attendant, I find that the patient has since remained perfectly well and is not aware of having passed the plate per rectum. The plate was made of vulcanite and was small, carrying but two teeth.

CASE IV.—Mrs. R., aged thirty-five, came to out-patient department April 20, complaining of pain behind the sternum at level of xiphoid cartilage, and of having swallowed her false teeth the previous day, owing to a fall.

No indication of their whereabouts could be got by examination through the screen with X-rays or by skiagram. An oesophageal bougie could be passed to the stomach without impinging on a

foreign body. Diet of solid nature was ordered and patient was sent home. On the third day from first swallowing the plate (two days from first coming to hospital) the patient brought the plate, which had been passed per rectum the previous evening. It was made of vulcanite, with two sharp metal hooks, and carried four incisor teeth, the longest diameter being one and one-fourth inches.—*Journal of the British Dental Association.*

NEW THEORY IN REGARD TO CARIES OF THE TEETH.

At the meeting of the California State Dental Association, held at San José in June, 1898, Dr. A. C. Hart, professor of Clinical Dentistry in the College of Physicians and Surgeons of San Francisco, propounded the following theory in regard to dental caries:

He takes the ground that decay is a natural force, acting through media, the chief of which is water on all material bodies. That it is not bacteria, acids, alkalies, salts, alcohol, and oils that cause or prevent decay, but that their action is dependent on water. To bacteria he would ascribe the cause of the fever present in diseases like typhoid, scarlet, yellow, and other fevers that owe their origin to the growth of bacteria. He showed the enormous power bacteria have for consuming water, and ascribed the emaciated condition present in consumption due to the power of abstracting water from the tissues on the part of bacteria. He believed there was some truth at least in the practice as followed by the ancients in refusing a fever patient all the water he wanted. He would combat the action of bacteria by keeping the water protected in the tissues from the solvent action of bacteria. This, he claims, is the manner of action of many of our most powerful antiseptics and germicides. He says,—

“We speak of persons being immune or susceptible to bacterial growth. Immunity, I believe, is the result of the cells becoming so specialized as to be able to place the water of combination insoluble or inaccessible to bacteria, and *vice versa*.

“Oil poured on water will form a film that retards evaporation and growth of bacteria. Bacteria will not grow on tissue covered with any of the essential oils, like oil of cinnamon, because the oil protects the water, or has a greater affinity for the water than have the bacteria. So it is by protecting the water in tissues by treating them with solutions that have a greater affinity for the

water in the cell than have the bacteria that our chief antiseptics and germicides owe their power.

"Disease generally makes its appearance through a change in the water, which is ninety per cent. of the body weight. The more stable we can keep the water in the body the greater its power of resisting disease.

"Now for practical application: let us see if we can place the water in the teeth insoluble to bacteria. We know that decay oft-times becomes checked and the enamel and dentine immune to bacterial growth. I believe this immunity is due to the dentine and enamel having attracted compounds that have a greater affinity for the water in the tooth than have the bacteria, or because the tooth has taken up substances insoluble to the action of bacteria, as is seen in the mouths of users of tobacco.

"I have tried for the past three years to harden enamel and dentine against the action of bacteria, and have been uniformly successful in making the tooth take up substances like formaldehyde, nitrate of silver, sulphate of copper, chloride of zinc, and other substances of a like nature that have proved themselves to be powerful antiseptics and germicides. I believe their power is directly owing to their ability to place the water in the enamel and dentine so as to be insoluble or inaccessible to bacteria. I have treated with success cases where the teeth were covered with white, chalky spots, literally melting away before the action of bacteria, without removing the decay or filling.

"Last year I advocated formalin or formaldehyde as an agent possessed with great power in hardening tooth-substance against the action of bacteria. After another year's experience I can report nothing but success. I believe it is a step in advance when we as a profession recognize and use agents that prevent the action of bacteria on the teeth. We cannot prevent their growth in the mouth, but we can use the means in our hands to stop decay. By so doing we will clear the field of those vultures that prey on the people, and through gilded and glaring signs of 'painless extraction,' ruin their teeth and shorten their lives. But the people must be educated to value their teeth. That they are soft, chalky, and decay because of bacteria. That it is possible to so harden them that they will resist the solvent action of bacteria."

GENERAL MEDICAL COUNCIL, GREAT BRITAIN—ABSTRACT OF DISCUSSION UPON MATERIA MEDICA.

Dr. Heron Watson.—I have to note that it is not taken notice of that materia medica has been entirely dropped out. I am quite aware there are some remarks made, explaining that materia medica is supposed to be included in "dental surgery, pathology, and therapeutics;" further on in the recommendations, that "therapeutics" are presumed to cover the whole. I merely mention this in order that I shall not be told that all this has been passed, and that I had no right to speak later on. I have no objection to deferring any remarks I have to make.

Mr. Bryant.—I beg to move "that recommendations (v.) and (v.) (a) read as follows: '(v.) That he has attended courses of instruction in the following special subjects at a recognized dental school: (a) dental anatomy and physiology, human and comparative, with practical work and demonstrations in dental histology for three months.'"

Mr. Tomes.—I beg to second that.

Mr. Tichborne.—What is a recognized dental school?

Dr. MacAlister.—A dental school recognized by one of the licensing bodies.

Mr. Tichborne.—A medical school?

The President.—If there is a dental department attached to the school, I presume.

Mr. Carter.—Would it not be as well to introduce the words "for at least the period specified" after the words "dental school."

Mr. Bryant.—Yes, there is not the least objection to that; I will put that in my proposal.

The resolution was put to the Council as follows: "(v.) That he has attended courses of instruction in the following special subjects, at a recognized dental school, for at least the period specified: (a) dental anatomy and physiology, human and comparative, with practical work and demonstrations in dental histology for three months."

This was agreed to.

Mr. Bryant.—I beg to move "that recommendation (v.) (b) read as follows: '(b) Dental surgery and pathology for three months, including materia medica and therapeutics applicable to dental surgery.'" Perhaps, anticipating objections which may be raised, I may say that we thought it was expedient to cut out the

whole course of lectures on *materia medica*, and really the student was not wanted to know the whole *materia medica*, but only as much as is applicable to his own branch of the profession, and that therefore it was as well to remove that load from his shoulders. In a certain institution, which shall be nameless, that has been cut out. There is not the least reason why the student should not be called upon to attend the six months' course in *materia medica* if he likes, with six lectures a week. The committee think that the student is fairly well loaded already, and that we may fairly cut that *materia medica* out. The same institution, which shall be nameless, has cut it out from the general medical students.

Mr. Tones.—I beg to second the recommendation.

Dr. Leech.—I am quite in favor of the *materia medica* as a whole course being struck out, but I hardly like the way in which it is put here. I know the lectures with us are given separately. Therefore this does not read well. I think it would be better to read "together with a short course of *materia medica* applicable to dental surgery."

Mr. Bryant.—I do not think that was the intention of the committee. It leaves it open for an extra course of *materia medica* if a school wishes it. It was thought probable and advisable that sufficient teaching in the *materia medica* would come in the treatment of dental surgery in the affections which come under the notice of the dental surgeon. But the treatment of those would be dealt with by the lecturer. That is merely to satisfy the requirements of some of the schools. Others may give a short course, and others may think it better to let the student have a complete course of *materia medica*. Any one of those three methods are open to the teaching bodies, and therefore it was thought that it should be introduced as I have read it to you.

Dr. Pettigrew.—I think it is quite obvious that the *materia medica* does not naturally fall either under dental surgery or pathology. I think it ought to be separated, as indicated by Dr. Leech.

Sir C. Nixon.—Why a dental student should have a knowledge of the *materia medica* I really cannot understand.

Dr. MacAlister.—It is only so much of it as is applicable to dental surgery. Dental surgery includes the treatment of the teeth, and may include mouth-washes and antiseptics, and so on.

Sir Wm. Gairdner.—It would be better if the dentists had short courses of these things suitable for themselves.

Dr. Leech.—Surely the dentist should be familiar with the

therapeutics of arsenic. Again, he is using carbolic acid constantly. He should know something of the things which he uses. I think a short course of a few lectures would be enough for him. It seems to me it would be better to mention that. I am very glad that *materia medica* is cut out, but a man should know something about the things which he is employing.

Mr. Bryant.—Do you not think that the resolution is sufficient?

Dr. Leech.—It seems so little that it will practically lapse altogether.

Mr. Bryant.—We will put “with” if you like, instead of “including.”

Mr. Carter.—Although partly responsible for the report, I do not see how the surgery could include *materia medica*.

Mr. Bryant.—Put the word “with.”

Mr. George Brown.—Perhaps Mr. Tomes could throw some light on this subject, as to the necessity of a thorough knowledge of *materia medica*. I remember a book entitled “*Dental Materia Medica*,” which appeared to me to contain a very extensive range, not only in the preparation of mouth-washes and stoppings for the teeth, but also as to the administration of drugs. I should like to know whether that is the case or not.

Dr. Watson.—It is obviously the intention of the committee that they should not only condemn *materia medica* with faint praise, but that they should really eliminate it altogether. No doubt if the course of dental surgery and pathology contains any requisite on this subject, a student may be the better for it, and a conscientious teacher, who wishes to make up for want of interest on the part of this Council in connection with that subject, may feel it his duty to extend it to his course. The part to which I previously referred, namely, of “*Dental surgery, pathology, and therapeutics*,” seems extremely bare when taken by itself; you will find there is no mention there of *materia medica*. Does that include *materia medica* or does it not? I think we are accepting a serious responsibility in doing this. I am confident that however little we may wish dentists to write prescriptions, that they do such things, and that there are not a few students who will become dentists and carry on at the same time a connection with this business at a profit. Under those circumstances, they should be called upon to have a competent knowledge of what may be deemed necessary for a patient coming under their care.

Mr. Bryant.—That is rather an assumption on the part of Dr. Watson. A student will be taught, we hope, and will be examined

in materia medica and therapeutics so far as it is applicable to the department of surgery, and no more.

Dr. Heron Watson.—In the professional examinations there is not one word about materia medica.

Mr. Bryant.—We do not wish to encourage dentists to prescribe for ordinary diseases.

The President.—There has been put into my hands by Mr. Bryant a slight modification of the phraseology of “(b) Dental pathology and surgery with materia medica and therapeutics in their application to dental surgery for three months.”

The resolution as amended by Mr. Bryant was agreed to.—*Journal of the British Dental Association.*

Reports of Society Meetings.

ACADEMY OF STOMATOLOGY.

A REGULAR meeting of the Academy of Stomatology was held April 26, 1898, at the rooms of the society, 1731 Chestnut Street, Philadelphia, the President, Dr. Edwin T. Darby, in the chair.

A paper entitled “Treatment of Cervical Borders” was read by Dr. Safford G. Perry, of New York.

(For Dr. Perry’s paper, see page 567.)

Upon the conclusion of the reading Dr. Perry showed the illuminating devices alluded to in his text, and also demonstrated the use of the pluggers, which he regretted that he had forgotten to bring with him.

DISCUSSION.

Dr. Guilford.—I am very much gratified, indeed, to have Dr. Perry come over and read us his able paper. He rather apologizes towards the last for going too much into detail. I think the mistake is generally made in the opposite direction. I am very glad, indeed, that he said all he did say.

We formerly heard a good deal about the failure of gold fillings at cervical borders, and it was inferred by some that they failed simply because they were of gold. The fact of the matter is that a large share of these failures were due to the fact that the cavities were not properly prepared. That they were not was partly because we did not understand how to prepare them, and partly be-

cause we did not use the rubber dam, and did not previously dry the cavities thoroughly. In the preparation of a cavity without the rubber dam these little checks at the cervical margin are not noticeable, but when the cavity is thoroughly dried we can see them. These places should always be cut out. I meet with them every day in my practice, and I keep cutting until I remove every portion. I think we have fillings that are more satisfactory than those of twenty-five years ago, simply because we know now better how to prepare cervical margins. It was not very many years ago that Marshall Webb and others thought that, in order to get a cavity properly prepared at the cervical margin, it was necessary to go above the free margin of the gum, and to extend the cavity upon the sides, in order that it might be cleansed by the brush and cheek. In that way we made cavities that were inordinately large. I have felt that this was not necessary, and I am glad that Dr. Perry does not believe in extending cavities beneath the gum for the sake of getting them beyond the danger line. If I find that the edge crumbles I cut down farther, but when I get a sharp margin I stop, no matter whether it is under the gum or not. I have noticed that within the last ten or fifteen years, not only with my own but with the fillings of others, that there are far fewer failures at cervical margins of gold fillings than there formerly were. I think this is due to the proper preparation of the cavity, better quality of gold, or perhaps better manipulation of the gold, and then, too, the care exercised in the finishing of the fillings.

In the placing of fillings with the use of the rubber dam, clamps, matrices, etc., we must necessarily cause a certain amount of pain, but we should not exceed the minimum amount. The pain of finishing the filling is minimized by the use of the matrix. It should be flexible and sufficiently yielding to permit the filling to be built out to the same shape as the tooth, but a little beyond the cavity margin. All that is then needed is to trim it up with a suitable sharp instrument, such as the Gardiner knives, and to polish it. This method of finishing is almost painless, while the old method of filing the filling to shape caused much suffering. Finally, the ordinary paper disk or tape properly used will make the surfaces very smooth indeed.

Dr. McQuillen.—I want to thank Dr. Perry for his very valuable paper, and also for the many instruments that he has given us at different times. I am always particularly pleased to hear him. The method of repairing gold fillings with amalgam is a practice I have carried out for a great many years, and I treat the work of

other men as I treat my own; it never seemed to me an honest thing to tear out a filling that had failed at the cervical margin when it could be patched and saved for years. I have had very good results from these repairs.

Dr. Kirk.—I think every one has been very much interested in this paper. There were two points that occurred to me during its reading that seemed to be especially interesting: for one thing, the emphasis that Dr. Perry has laid on the well-known habit of zinc phosphate cements to disintegrate at the cervical border. Of course, as every one knows, zinc phosphates are a heterogeneous lot: they have all sorts of variations of physical properties and are more or less valuable; but even supposing zinc phosphate to be a constant thing without variations in itself, the conditions under which it is placed in the mouth vary so considerably that in some mouths it may do well and in others it may absolutely fail.

Attention has been brought recently by Dr. Cassidy to a fact that has not been recognized in relation to oxyphosphate of zinc, and that is its liability to disintegrate under the action of alkalis.

More recently a gentleman, whose name I cannot recall, wrote a little note for publication in reference to ammonia as a means of disintegrating zinc phosphate cements from about the broken pins of artificial crowns. He recommends the application of ammonia water to the zinc phosphate cement, and says it rapidly brings about its disintegration. I have made experiments myself, and find that zinc phosphate can be disintegrated by the application of ammonia. It seems that the phosphoric acid leaves its combination with the zinc, uniting with the ammonia, and the compound falls apart.

Dr. Cassidy explains the disintegration of zinc phosphate at the cervical margins upon the hypothesis that putrefaction of nitrogenous matter takes place there, and that ammonia is produced. Whether that be true I do not know. It is evident that where the alkaline condition is pronounced it would be possible for zinc phosphate fillings to disintegrate. I have seen cases where the failure of cervical margins with zinc phosphate has not been a failure of the cement, but of the tooth substance itself. I have seen caries supervene at the cervical margin, where the imprint of the original margin was still in the zinc phosphate. So not all failures of zinc phosphate are due to disintegration of zinc phosphate. I do not say that is frequent, but I have seen such fillings where the imprint was left.

There is another feature of Dr. Perry's paper that seems to me

to need further emphasis, and that is the question of failures of fillings at the cervical margin by over-malleting. Many have fallen into the error of believing that cohesive gold requires an excessive amount of force to secure its consolidation. Two things have led me to a different view in regard to that matter: first, the demonstration which I saw given in New York by Dr. Shumway, of absolutely welding cohesive gold-foil by simply the wiping motion of ivory points. One piece of gold-foil was put upon another in this manner, and the mass afterwards tested and found to be solid and homogeneous. Second, the demonstration by Dr. Gardiner to-day, where he packed Nos. 60 and 90 rolled gold with as light a blow as I ever saw used on an electrical mallet. I felt as though the force was not sufficient to securely weld the piece, but when I saw him whittling down from the margins towards the filling, giving it as severe a test as possible,—and the gold was cut off in shavings,—I was convinced that he had produced an absolutely homogeneous result. The danger of fracturing the cervical margin was reduced to a minimum.

Dr. Pierce.—I do not know that I can add anything. I have been very much interested in this paper. I noticed that the essayist and others spoke of the enamel of the cervical border.

Nearly all our cervical borders reach to the cementum, and I think that is one reason why this locality is a complicated one, in which it is much more difficult to make a reliable operation.

I feel oftentimes that gold fillings, instead of being cut out, can be patched very satisfactorily by the use of amalgam, when we can make a little undercut above the filling.

Years ago Dr. Neall handed me a tooth he had extracted; above the gold filling he had placed an amalgam repair, saving the tooth satisfactorily, although the tooth subsequently loosened and came out. I believe many operators have utilized amalgam in that way very satisfactorily.

I am convinced that our operations are made more valuable by the use of good antiseptics in the mouths of our patients, and that many operations that would formerly have failed by virtue of unfavorable conditions, and also the sound teeth, have been protected by the increased hygiene of the oral cavity. I scarcely believe that the credit is due to better operations.

I do not think that cohesive gold has added anything to the success of our operations upon the cervical border; I think it has detracted from it. The success has been due to the care subsequently given to the teeth by the patient.

Dr. Register.—I was pleased to hear Dr. Perry condemn deep undercuts and state that they sever the dentine fibrils and permit blue discoloration about fillings. I always shape my cavities so that such a condition will not exist.

I believe in the matrix, and use thin strips of soft metal, such as German silver or copper, which I ligate to the tooth with floss silk. By the use of a matrix a compound cavity is converted into a simple one to our manifest advantage. Inasmuch as many cavities may be prepared carefully and yet upon examination with a glass show certain defects of the margin, it is necessary to carefully examine for any such defects and to use antiseptics to destroy any germs which may be located upon the margins or walls. To this end I use seventy-five per cent. nitrate of silver, as suggested by Dr. Truman, but as that stains the tooth, I change the nitrate after it has acted upon the germs into iodide of silver by the action of iodine. In turn this may be destroyed by ammonia, leaving the tooth sterile and stainless.

Dr. James Truman.—There were one or two points that arrested my attention during the reading of the paper that seemed to me to be of importance.

I have a very great fear of zinc phosphate, not only at the cervical borders, but upon the floors of deep cavities, where we are using it oftentimes with danger to the pulp, as it must certainly affect the odontoblastic processes in the dentine. There is too much carelessness in its use. I have recommended the students in the clinics, whenever I find them using oxyphosphate of zinc at cervical borders or upon the floors of cavities, to lay a protection of gutta-percha beneath it.

When I heard Dr. Perry state that he could not use tin at the cervical border without its disintegrating, it seemed strange to me how we all differ on many points that are of practical importance. I remember that Dr. Jenkins, of Dresden, once said that he could not fill a cervical border with gold, that he had given that up as a practical impossibility, but that he could use tin and gold with perfect satisfaction, and I am forced to agree with him, not only as to the use of tin and gold, but tin alone, when put in upon the cohesive principle, as I think all tin should be used. Of course, I bow always to Dr. Perry's large experience in this matter, and hesitate even to oppose that much of his paper.

I believe a large proportion of failures at this time are due to the extravagant use of matrices and supporters, rubber dams, ligatures, and everything else that go to make up the filling of the present

time. I think the dentist, as he leaves a filling, pays very little attention to subsequent results, and that a large proportion of cases of pyorrhœa have their origin in the operator himself. The gingival margins are left in a state of irritation which develops into inflammation and pyorrhœa. I had an illustration of that in the clinic at the University, where one of the students had placed the day before his rubber dam and ligatures without previously antisepticizing the parts (which I had always urged), and the result was a high degree of inflammation, not only around the tooth operated upon, but also around the next tooth. I should have been very glad if Dr. Perry had spoken more at length on that particular point. I regard the cervical border, and always have, as he does, as the delicate point of operating. I do not regard it, however, as impossible to place cohesive gold there. In an earlier period, after previous years of use of soft foil, we came to the exclusive use of cohesive gold. We saved cervical borders, I think, quite as well as before. I saw Dr. Gardiner operate to-day, and I must say that I was very much pleased with the blow of his mallet. Still I do not believe in using one at the cervical border, as I am satisfied that to its excessive use is due much of the trouble with that border.

Cracks can be made by over-malleting, and when made at the cervix invite decay.

In olden times when cohesive gold was first introduced, and we had no mallets but used simply hand-pressure, the cervical border remained intact. I have great faith in combination fillings, and I believe that by the use of amalgam and gold, or the various combinations of gutta-percha, zinc phosphate, amalgam, and gold, more teeth will be saved than formerly.

Dr. Gardiner.—I feel greatly indebted to Dr. Perry for his very conservative paper. I came expecting to get very many ideas and I have done so.

I do not think it is necessary to extend proximal cavities beneath the gum. I think they should be cut beyond the point of contact, but that does not indicate that they should be extended farther if the tooth is in good condition. I think cohesive gold can be packed against cervical walls perfectly, provided it be done in the proper way, either by hand-pressure or mallet. I use cohesive gold to-day simply because I get better results from it. That does not necessarily follow it would be better for everybody else. I use a great deal of leaf gold at the cervix, because I think it is extremely soft and can be packed thoroughly with very little

trouble, either by hand-pressure or mallet. I use a mallet for convenience; there is less danger of slipping, and I think in my hands less danger of fracture of the wall than with hand-pressure.

In relation to oxyphosphate fillings, it has been my practice to put gutta-percha next to the gum. I have had excellent results from using high-heat gutta-percha, and prefer it to low-heat, because there is less liability to bulge.

Dr. Louis Jack.—In deference to the views of Dr. Abbot, of Berlin, and of others who have followed his opinions, I have repeatedly used tin at the cervical border of fillings. The result has been that the tin has wasted, leaving a depression in the tin at the cervix. This waste I attributed to electrolysis, since the tin obtained the relation of a positive element to the gold. Next I mixed the gold and tin by folding the two together, and applied it in cases where the teeth presented but slight resistance to the exciting causes of caries. The results here were better, since the same waste did not appear. Some peculiar action takes place by which the two metals appear to combine to form a dark mass, not having much hardness. I think, however, that at length this mass must become disintegrated. To my mind it has merely its softness to recommend it, and yet it is hardly superior to non-cohesive gold in this respect. I am decidedly of the opinion that there is no incompatibility between gold and tooth-structure if the method of filling is such as will produce perfect contact between them, and at the same time sufficient density to retain smoothness. I have had gold fillings continue in this position side by side with plastics where the latter failed for one cause or another, probably because the latter did not present the smooth surface essential to cleanliness. At the cervical border I prefer, first, absolutely non-cohesive gold, and, second, a good amalgam. The latter does not appear to undergo the changes which take place with tin.

Dr. Roberts.—I would like to ask Dr. Perry whether his plugger-points are flat or rounded on the ends. In the place in which he uses that triangular plugger-point I have been using the flat, edged-knife plugger-point.

I am also glad of the very good word that Dr. Perry gave for gutta-percha; I think success in packing gold lies in being kind to it. I think that is the chief feature of Dr. Gardiner's manipulation of heavy foil,—he is kind to his gold, and handles it gently.

Dr. Perry.—These pluggers are made perfectly flat upon the plugging end, which is triangular in form, and slightly serrated. The sharp corners do not count for so much; it is the peculiar rake

of the point of the instrument, which enables it to go against the matrix, that is the telling thing.

Dr. O. E. Inglis.—It may possibly be superfluous to say anything more, but as the subject of combination fillings has been brought up, I would state that a year ago I saw a combination filling made of gold and amalgam which had been in place for seventeen years. It was in a position in which gold would have served equally well, but it was doing very good service.

The President.—Dr. Perry, have you anything to say?

Dr. Perry.—Just a word, Mr. President. I am obliged to Dr. Peirce for calling attention to the cervical margin above the junction of the enamel. I thought after the paper was finished that I had not given it attention. Dr. Guilford's remarks remind me of the subject of careful preparation of these cavities.

In reference to the wasting away of tin-foil fillings at the cervical margin, my own belief is that not in all mouths does tin-foil disintegrate, but that it usually does so at the cervical margins after a few years. In some mouths I am certain of it, and I believe myself that tin foil dissolves the same as oxyphosphate does. Of course, we know perfectly that when tin-foil is exposed to wear it always remains bright, and is one of the best fillings we have, but those soft tin-foil fillings slowly disintegrating at the cervical margin, while the rest of the filling stands well, I have seen for many years, and so continuously that I have come to be naturally distrustful of tin when used in these places, and for that reason I have of late years eschewed its use at the cervical margin, either alone or combined with gold; with the combination of tin and gold I obtained no better results than with tin. I could get as good a margin with non-cohesive gold (rolled) as I could with the combination.

Dr. James Truman.—If tin is packed by the old method, then it does disintegrate, but if used cohesive as it is now made, I think it will stand as well as most materials. It must be packed upon the cohesive principle and must be of good quality. As formerly made, with the oxide left on the surface and packed in ropes upon the wedge principle, the results Dr. Perry speaks of would be liable to follow.

Dr. Perry.—Mr. President, I may be wrong in this matter. I remember that when you came over and read a paper before our society you brought with you some teeth that had been filled with tin by your students, and I remember that years ago we saw in New York tin fillings made by you from fresh-cut shavings of

block tin, and that these seemed to possess a solidity and hardness we had never seen before. It may be that I have been misled, and that the tin used then by myself, and fillings I had seen placed by others, may have been put in in the loose way and disintegrated for that reason.

The other day, in a clinic before the Odontological Society, Dr. Shumway demonstrated several new points. In the first place, he annealed tin over mica nearly to the point of its melting, and packed it into the bottom of the cavity in the usual way. That tin had the appearance of being a solid piece, and any one upon seeing the operation must have felt at once that the heat used had much to do with the solid condition obtained. He seemed to punch it into the cavity very easily without any effort, and as soon as an ivory point was rubbed over it there came out a beautiful surface; then a little flat piece of cohesive gold gently touched with the ivory point was run back and forth. The gold was brought into adhesion to the tin. If that style of filling teeth could come into vogue, I think we could feel that we were artists. It is very far removed from the blacksmith's sledge-hammer method of hammering gold.

I am glad also to commend Dr. Gardiner's idea of packing with very light blows of the mallet, and I believe that can be done. I have done it myself and in about that way. I have found a great many times that cohesive gold could be very accurately and easily packed by gently tapping it. If you pack it too much you will harden it. In fact, it is claimed that flexibility and softness of the ivory point, together with a peculiar elasticity of the handle of the instrument, are the very conditions necessary to impart that surface to the gold which allows the next piece that comes on to cohere, while if the gold is rubbed with hard steel instruments the surface is so hard that the next piece of gold coming into contact does not cohere.

Dr. Kirk saw some of Dr. Shumway's work, and, I think, felt it was a surprising thing to see what he did.

Dr. Kirk.—I am full of this matter. I do not want to interrupt, but I am sure that the matter which Dr. Shumway has developed is important. Whether it will develop as a practical method of operating is another question, for we have had various methods introduced that have been extremely interesting, but which have fallen into disuse from a practical standpoint; but it was interesting to me as a practical demonstration of the scientific exposition by Dr. Black, that where we have a clean surface of gold, as soon

as we get contact we have cohesion. There is no doubt of it, and Dr. Shumway has demonstrated that it requires practically no force to bring the tin and gold surfaces into close relationship, that we get perfect adhesion of these materials. I believe his argument is based on correct principles.

Upon motion by Dr. Register a vote of thanks was presented to Dr. Perry for his paper.

Adjourned.

OTTO E. INGLIS,
Editor Academy of Stomatology.

Editorial.

THE RECENT CONVENTIONS.

THE conventions called to meet at Omaha on the 26th and 30th of August have performed their allotted work and passed into history. The selection of this period of the year, under the supposition that it would be found more agreeable in temperature, was proved a serious mistake, for the excessive heat of a remarkably hot summer was intensified, and life at Omaha was made almost unendurable.

The Association of Faculties met at the appointed time, with but few colleges unrepresented. The work of this body was, upon the whole, satisfactory, and much of value was accomplished. There seemed to be a determination to have this meeting show an advance in every direction; in fact, the writer never before witnessed a more harmonious effort to bring dental college work to a standard consistent with the demands of the period. There was no opposition to the resolution requiring a course of seven months, this being passed with the proviso that a college preferring a four years' course could continue the present term of six months.

The preliminary standard was advanced to the entrance of the second year of a high school, and the examinations for this are to be conducted hereafter by county superintendents of schools. This, in the opinion of the writer, constitutes an element of weakness. While it is well to have these preliminary examinations made by disinterested parties, there is no certainty that these will be made as desired by the officials named. There appeared to be no other

way to meet this difficulty, and if found unsatisfactory in the future can be changed.

There was considerable friction manifested upon the admission of certain colleges through local opposition. It is time that this character of antagonism should be eliminated from the Association of Faculties. The duty of this organization should be to receive all schools properly endorsed without regard to the opposition of competitive colleges. It is idle to expect that dental colleges will cease to multiply under present State laws, and it is, therefore, the part of wisdom to have these, at the earliest possible moment, under the control of this body. It is recognized that the number of dental colleges is far beyond present needs, but it is not the province of the Faculties to limit the number. While the force of this organization is of a purely moral character, it has held a controlling power over its membership far superior to legal restraints, hence factional opposition to admission should be discountenanced.

The report of the "Committee on Recognition of Degrees in Foreign Countries," Dr. W. C. Barrett, chairman, was in many respects an astounding revelation. It will be published, and should then receive the careful reading of the dental profession. It was shown that in Chicago alone there were a number of legalized affairs, not colleges in any sense, making a business of manufacturing diplomas, not only in dentistry, but in all departments of human knowledge. These were kept for sale only in foreign countries, none being sold in the United States. The details were absolutely shocking to those present not previously informed. There could be, however, no dispute as to the correctness of the charges made. The Association took immediate steps to endeavor to stop this nefarious traffic, but this cannot be done without legal evidence. Unfortunately, the Constitution of the State of Illinois years ago made the procurement of a charter a very easy matter. The motive was apparently a good one as applied to general business, but under it unscrupulous men saw their opportunity and, driven from other States, settled here with the result that these fraudulent diplomas have found their way into all parts of the Old World. Dentists in foreign countries will now, it is hoped, aid the committee in the procurement of evidence against these men, for it *must come from the other side*, and cannot be had in the United States. It took years of continued effort to secure legal evidence sufficient to convict the notorious Buchanan, but it ought not to require much time or ingenuity to accomplish more speedily the same result in these cases.

The National Dental Association met with a large attendance from all sections of the country, the Pacific coast being well represented. It would be pleasant to write that these were well repaid for the time and money expended, but the truth must be stated that the meeting was practically a failure. This was the general sentiment, and some even went further and asserted that the National had been strangled in its birth. This, however, is not the opinion of the writer. There were many reasons why this meeting should have been unsatisfactory. The war diverted the minds of men into other channels. It is very certain that the arts of peace have not been cultivated the past year. Then, again, the heat of the past month, almost unexampled in severity, has unfitted every one for work upon matter suitable for such a meeting. In addition to these the heat at Omaha made attendance at the sessions a period of suffering. Making due allowance for these obstacles, the fact remains that there was an evident lack of preparation for this meeting. The papers were few, but several of these were of excellent quality. The one fault of this meeting was a too lengthened attention to routine work. The first day was almost entirely occupied in settling questions that should not have been brought before the main body. The second day was somewhat better in this respect, and the third, and last day, was mainly taken up by selection of officers and place of meeting. From this brief outline it will be quite evident that those who took the long, hot journey received but poor remuneration for the effort.

It was also evident that the members present felt that something must be done to save the organization, and this resulted in a spontaneous effort to inject a more vigorous element into it. This feeling resulted in the election of one of the younger men as President, Dr. Burkhart, of Batavia, N. Y. His well-known ability insures the meeting for next year from disaster. If, however, his energy fails to rescue it, then the dentists of the country must look forward to an entire reorganization of the national body upon a different plan from that heretofore adopted.

When the time comes for another meeting in the West more attention must be given to the place than was accorded it at Old Point Comfort. Omaha would not have been objectionable at any other season of the year, but it has been made evident as very unsuitable during the warm period. The hotel accommodations were not equal to expectations, and in some respects were of a decidedly inferior character. The Executive Committee, in the future, should exercise more care in the examination of hotels, and thus avoid the

discomfort and annoyance many were subjected to on their first arrival in that city.

Niagara Falls was selected as the place of meeting in 1899. This was especially desired by the Western members. The best meetings of the "American" were those held at this place, and now that the President resides in the near neighborhood, much of the difficulty attending the recent meeting will be obviated. It is, therefore, safe to predict a gathering next year worthy the dental profession and in accord with its past history.

GENERAL MEDICAL COUNCIL OF GREAT BRITAIN.

THIS very important body has had added to its membership Mr. Charles S. Tomes. This has only been accomplished after a long struggle, in which our colaborers on the other side had to contend with medical prejudice and custom. That they finally conquered is a positive credit, but that they succeeded in securing as member Mr. Tomes is worthy of special congratulation. He is certainly the right man for the position.

It is quite evident, from the abstracts given upon another page, that this body sadly needed missionary work; at all events, the benighted Sir C. Nixon needs enlightenment and conversion. It seems passing strange that any one could be found willing to give utterance to the following: "Why a dental student should have a knowledge of the *materia medica* I really cannot understand." Sir Nixon has probably passed the age when revelations come to men, but it would not be unworthy even his high position to seek wisdom by a closer study of dentistry and its relations. In American dental schools, one and frequently two sessions are devoted to the study of drugs, in order that the therapeutics of dentistry may rest upon a solid foundation. This is equally as well understood in England, and why the council should quibble over it seems passing strange.

In reading the proceedings, not only of this council, but of all gatherings in Great Britain, one is impressed with the dignity which accompanies the proceedings. This might be copied with benefit in this country.

Bibliography.

A TREATISE ON PLATELESS DENTURES. By C. A. Samsioe, practising dentist in Stockholm. With forty-eight illustrations. Translated from the Swedish by D. O. Bell. Published by the author, Stockholm.

It is not often that the pleasure is given English readers of having a translation of a book made in that language in a foreign country, and in the one in which it has been issued and under the supervision of the author. The novelty is, however, here presented, and upon the whole, excellently well done.

The work is upon "Plateless Dentures," a name given by Dr. Samsioe to express "artificial teeth secured in place, not by a plate covering the roof of the mouth, but in such a manner that the size of the prosthesis (?) will nearly correspond to the size of the defect. Thus under this heading come pivot teeth and crown- and bridge-work, whether stationary or removable."

The book is divided into ten chapters and one hundred and fifty-eight pages. The first part consists of a brief description of various crowns used in this country and elsewhere, exhibiting a very accurate knowledge of this kind of work.

Chapter three is devoted to treatment of living pulps, gangrenous pulps, pericementitis, etc.

The original character of the book is not shown until the sub-chapter on "How to make the Porcelain Facing and the Pivot (Impression)" is reached. That and the next sub-chapter of "How to cast the Backing from the Impression" cover practically all of Dr. Samsioe's method. In order that this may be understood the following quotations are given: "After the pivot and the crown have been fitted to the root and to each other we proceed to unite them and to take an impression of the root. For this purpose the operator should grasp the thickest end of the pivot with the pivot-tooth pliers and warm it over a spirit-lamp. A suitably large pellet of an impression composition, especially manufactured by me for this purpose, is then caused to adhere to the pivot by means of heat. This composition . . . is plastic, hardens quickly, adheres very firmly both to the porcelain tooth and to the metal, and does not change volume or form either in or after cooling. After the

pivot and composition have again been slightly warmed the pivot is pushed into the root-canal as far as possible, whereby a perfectly true impression of the root is procured. . . .

"Then one of the small pins of the porcelain tooth, which are bent towards the cutting edge, is grasped with a pair of pliers and the tooth warmed over a spirit-lamp sufficiently for the operator to be able to press away the labial margin of the composition with a slight pressure of the tooth, and at the same time by melting it into the composition, secure the tooth in its right position in relation to the pivot and the other teeth in the row."

The author, after some advisory remarks, tells how to "cast the backing from the impression. The now fitted parts are invested in a little cast of plaster without admixture with sand or the like. Before the plaster has entirely hardened it is cut into a parallelo-piped or cube. Besides this cutting, enough of the upper surface of the plaster is removed to leave the crown free a couple of millimetres below the cutting edge, so that it may afterwards be easily taken up out of the plaster. . . . If the composition is suitably warmed . . . it is possible successively to take up the crown, the pivot, and the composition without injuring the plaster or leaving any composition in the mould. The crown and the pivot are scraped clean and the small pins of the crown are bent and roughened as in ordinary rubber-work, but so that they neither collide with the pivot or with the plaster, nor come so high that they can stand in the way in the later articulation.

"When the crown and pivot are again in their right place, both the platina-iridium or alloy pivot and the pins are wet with a fine brush dipped in the soldering acid, care being taken that no acid touches the porcelain tooth or plaster.

"Over the opening of this depression a couple of pieces of the alloy made by me for this purpose are laid. This metal, which consists of tin, silver, gold, and platinum, in suitable proportions to make it melt readily and solder well, to make it tough, hard, durable, and capable of resisting the acids of the mouth, is to be had at the dental depots under the name of 'Samsioe's Metal for Plateless Dentures.' The piece of work is placed on a coarse wire net over a spirit-lamp, or a Bunsen or Fletcher burner. In about ten minutes, according to the size of the plaster ball and the strength of the flame, the metal begins to melt. With a large and strong pair of tweezers the piece of work is then lifted from the net, is knocked carefully (so that the tooth will not jump out) against something hard, so that the metal is forced down into the cavity of

the plaster and surrounds the platinum pins. To make still more sure, the metal is pressed with a little piece of punk down into the cavity, and at the same time, just before the moment of hardening, the superfluous metal is wiped away, or it is forced up towards the cutting edge in order to form a chewing cusp. . . . If it is found that too little metal has been used, a little piece may be added to the melted mass, whose heat is frequently great enough to melt the added metal." The plate is then finished up.

The author gives many photographic illustrations of actual cases, not only of one tooth but a series of teeth inserted upon this method, which give a clearer idea of the work than words alone can convey.

While this character of work seems to be simple and readily adapted, it partakes of the objectionable feature of bridge-work, in that it is permanent, and, as represented, furnishes places for the lodgement of organic matter with the disagreeable results made familiar with that kind of work.

The book is well printed upon good paper, and, with the exception of a few typographical errors, it is not only a credit to the printers art in Stockholm, but a remarkable performance when all the circumstances of its production are considered.

Notes and Comments.¹

BISMUTH IN DENTAL ALLOY.—Mr. Thomas Fletcher suggests that a very small portion of bismuth gives a most extraordinary smoothness and plasticity to all amalgams containing silver and tin, without injuring their properties in any way. Although mixed with a small portion of mercury to pack firmly under the instrument, so perfect is its adaptation, that it can be packed against a flat surface of mother of pearl, and when hard the microscopic details of the surface which causes iridescence in the pearl are perfectly reproduced. Owing to this peculiarity it cannot be mixed or used in the hand, as it works into the pores of the skin and cannot be removed without great difficulty. In mixing the alloy, he suggests that only

¹ The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 1338 Walnut Street, Philadelphia.

enough mercury should be used to give a cohesive skin to the grains, enabling them to weld together under pressure.—*The Dental Record*, London, June, 1898, p. 295.

MAKING DENTAL ALLOY; ORDER IN WHICH THE METALS SHOULD BE ADDED.—Mr. Thomas Fletcher considers it an error in making an alloy containing platinum to first melt this with the silver. Silver and platinum, he says, are difficult to combine, and still more difficult to keep uniform. On the contrary, platinum and tin combine energetically, with the evolution of intense heat, at a temperature below the fusing point of silver. First melt the most fusible metal, then add the others. In this manner the alloy can be made at a temperature not greatly exceeding the fusing point of the most fusible of the metals used, and overheating is entirely avoided. Want of knowledge on this point, no doubt, has caused the extraordinary statements as to the inertness of platinum in amalgam. It never got into proper combination, or was probably localized in the ingot.—*The Dental Record*, London, June, 1898, p. 295.

ANTIDOTE FOR ARSENIC EROSION.—A. N. Dick, in the *Pacific Medico-Dental Gazette*, May, 1898, page 248, recommends tincture of iodine as a very reliable antidote for the erosive action produced in the soft tissues by arsenic trioxide. It has proved to be so certain and prompt in arresting the inflammation and ulceration caused by the accidental contact with the gums or cheeks that he regards it as a specific.

TO RESTORE ZINC FOR CASTING.—The only way to restore zinc that has become thick by repeated heating is to heat the metal to incipient redness, throw a small quantity of strong hydrochloric acid on the surface, and stir it with a stick. About two tablespoonfuls will render a large ladleful of thick zinc perfectly fluid. This, however, does not remove the iron. That can only be separated by redistilling,—an operation impracticable on a small scale.—MR. THOMAS FLETCHER in *The Dental Record*, London, June, 1898, p. 295.

Another way. An infinitesimal amount of aluminum added to thick zinc perfectly restores its fluidity. This is accomplished by first making an alloy of one part of aluminum to twenty-five of zinc. The thick zinc is heated to its fusing point, and small por-

tions of this alloy are added until the desired effect is produced. This process is the subject of a patent. It is in commercial use, where tons of zinc, that heretofore have been practically wasted, have been restored at a mere nominal cost.

DEATH FROM AN ABSCESSSED TOOTH.—Dr. J. H. Neeley, of Paulding, Ohio, reports in the *Ohio Dental Journal*, June, 1898, the death of a girl twelve years of age from blood-poisoning, with the following history: In September, 1896, she had a severe attack of typhoid fever, but recovered nicely. Soon after she had pain and marked swelling of the face on the right side. The lower first molar of that side, which was decayed, became loose and elongated. Fever again was present, and the physician was called, who, finding the cervical glands swollen, pronounced it a case of scrofula, and advised a course of treatment, which was granted. No attention was paid to the tooth. An abscess formed, and discharged on the face. This the physician pronounced "good," provided the discharge could be kept up, so that the other glands would not inflame and break; so for fourteen months the abscess was kept open, a compress being worn constantly to keep the saliva from flowing out. The odor was very offensive. In this condition the case came into Dr. Neeley's hands for the removal of the tooth, which by this time was a mere shell, the root being entirely absorbed. He urged the immediate removal of the diseased tissue, but was not permitted to do anything more than extract the tooth, the child being immediately taken back to her physician. She died two months later from blood-poisoning.

GENERAL MEDICAL COUNCIL OF GREAT BRITAIN AND THE DENTAL PROFESSION.—After many years persistent effort our professional brethren of Great Britain have won and are now represented in the General Medical Council, Mr. Charles S. Tomes having been appointed to that position for five years, filling a "crown" vacancy caused by the death of Sir Richard Quain. About the same time he was honored by being elected a Fellow of the Royal College of Surgeons, thus forestalling a possible technical objection that might have been made to his appointment. Mr. Tomes is well qualified for his unique position as the first dentist accorded membership in the General Medical Council, having been for a long time their adviser in dental matters, fulfilling in that capacity, faithfully and tactfully, many delicate commissions in a manner equally satisfac-

tory to the council and to the dental profession. This recognition of the dental profession by electing a dentist to membership in the council will remove a just cause of dissatisfaction and lessen the friction that now and again existed between the representatives of the dental profession and the General Medical Council.—Editorial in *British Journal of Dental Science*, June 1, 1898.

Current News.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

NOTICE is hereby given that the next annual meeting of the National Association of Dental Examiners will be held at Washington, D. C., commencing at ten o'clock A.M., Thursday, October 13, and continuing in session the 14th and 15th. The head-quarters will be at "The Hamilton," Fourteenth and K Streets, opposite Franklin Park. The rates will be two dollars and two dollars and fifty cents per day.

Members can communicate with Dr. H. B. Noble for additional information regarding accommodations.

The poll-vote closed August 9, with seventy-two votes for Washington, twenty for Louisville, seventeen for Chicago, and twelve for Omaha, balance scattering.

CHARLES A. MEEKER, D.D.S.,

Secretary.

29 FULTON STREET, NEWARK, N. J.

NORTHEASTERN DENTAL ASSOCIATION.

THE Fourth Annual Meeting of the Northeastern Dental Association will be held in Hartford, Conn., October 19 and 20, 1898. The Executive Committee have arranged for a programme of papers and clinics; also extensive plans have been made to have a good exhibit of dental goods and medicines. A large gathering is desired and confidently looked for.

EDGAR O. KINSMAN,

Secretary.

CAMBRIDGE, MASS.

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Original Communications.¹

SOME REFLEX DISORDERS OF DENTAL ORIGIN.²

BY HENRY H. BURCHARD, M.D., D.D.S., PHILADELPHIA.

REFLEX disorders of dental origin cover a wide field in both sensory and motor disturbances throughout the body, varying in latitude from pain referred from one tooth to a neighboring tooth, to referred pain in a limb terminal, from slight twitching of near muscles, to pronounced epileptiform seizures or paralysis. It is impossible in the limits of a small essay to consider all of the manifestations of nervous disturbance having their origin in dental diseases; nor, indeed, is it advisable to do so, as many of the cases are but rare clinical curiosities. There are, however, features of some degree of constancy which have occupied the attention of nearly every dental practitioner. These are the reflex disturbances arising from diseases of the pulp. Many of the cases of reflex disorders recorded in literature are difficult of classification, because reported by the medical practitioner, who, so far as I have been able to determine, has never differentiated diseases of the pulp from those of the pericementum. Reflex pains do occur in connection

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before the American Academy of Dental Science, February 2, 1898.

with diseases of the pericementum, but by far the greatest number of cases are found associated with diseases of the pulp. The reason for this is fully and clearly set forth by Dr. Black in Volume I. of "The American System of Dentistry."

The pulp in its normal condition does not possess the tactile sense, and, like similar organs, refers irritation to which it is subjected to some other point.

Such organs, however, do exhibit some degree of constancy as to the point of reference. For example, as pointed out by Black, affections of the iris have an almost constant point of reference to the brow, those of the hip-joint to the inside of the knee, and so on.

This same constancy is observed in connection with the vast majority of acute pulp-diseases; the pain, being rarely localized in the affected tooth (except in cases of acute and athenic pulpitis), is referred to some point or points of the corresponding nerve-trunk of the same side, the general rule being that the affections of the pulps of the lower teeth have pain reflected to some point of the course of the inferior maxillary nerve, frequently in the auriculo-temporal branch. Pulp-diseases of the upper teeth are most commonly attended by pain in some point of the superior maxillary nerve.

In connection with either, pain may be referred to the first branch of the fifth nerve; this latter reflection is to be regarded as the first of the remote references.

The next reference is to the ear, where not only sensory disturbances may be noted, but also those of special sense. Next in point of frequency are affections of the eye. While many of these are clearly traceable to reflex disturbance of the ciliary ganglion, there are others in which the second cranial nerve is involved. That is to say, while pain is usually confined to the ramifications of the fifth nerve, it may be referred to other nerves whose function is then disturbed; to the second, resulting in functional diseases of the retina; to the third, fourth, sixth, and seventh, in which cases motor disturbances of the muscles about the eye and head are noted; to the eighth, producing disorders of hearing; to the ninth and tenth, when disorders of the tongue, pharynx, larynx, and other parts may be noted, as recorded in dental literature.¹

The spinal nerves may be affected, resulting in painful diseases of distant parts,—the uterus, a thumb, or even a toe. In addition

¹ Brubaker, *American System of Dentistry*, vol. iii.; Lauder Brunton, *Proceedings of the Odontological Society of Great Britain*, 1880.

to these should be mentioned the functional disorders of the cerebrum itself, cases of which have been recorded.

To generalize: The acute affections of the pulp are those in which wide reflex disorders are rare. In the chronic diseases, notably in connection with chronic degenerative changes, reflex disorders are common; and *vice versa* in diagnosis; localized pains about the jaws point to the more acute diseases of the pulp; distant pains arouse suspicion of chronic diseases of the organ.

The dental diseases to which such pains are traceable may, for convenience, be grouped under four heads,—1. Reflex disorders due to the irritation of the hypersensitivity of dentine. 2. Those associated with acute pulp-diseases. 3. Those arising during the progress of chronic pulp-diseases. 4. Reflex disorders due to diseases of the pericementum.

While it is certain that almost any of these dental causes may be associated with almost any extent of nervous transference, it is extremely probable that pains may be and often are ascribed to a dental source where their true origin lies in other organs. The teeth may be the seat as well as the source of reflex pains. This is notably true in patients who suffer from chronic malarial poisoning, from gout, and in some cases from secondary syphilis. In the gout cases, however, it is more than probable that pathological conditions exist in and about the teeth to which general dental pains are due.

The test of a dental origin of a distant pain should be, Does the pain disappear promptly upon the correction of the dental disease without any other treatment? The vast majority of localized pains about the head and face are due to diseases of the eyes and teeth. Those of the eyes are most frequently located in the first division of the fifth nerve, and, as stated, those of the teeth in the second and third branches. These rules are open to many exceptions, but serve as directing signs in the location of the causes of facial and cranial pains.

REFLEX DISORDERS DUE TO EXPOSED DENTINE.

As a general proposition, it may be stated that reflex disorders due to the irritation of hypersensitive dentine are most frequently associated with its peripheral exposure; furthermore, the most common situations of the points of irritation are upon the necks of the teeth, where a limited amount of cementum has become exposed and removed, laying bare the dentine. This rule is also open to wide exceptions, but is a useful guide. Other situations which should be mentioned are upon abraded surfaces of teeth and in

superficial cavities. As in all dental disorders, the extent of the reflexes is governed by peculiarities of the individual, being most pronounced and remote in individuals who present a neuralgic dyscrasia. In the ordinary individual, such a condition as a neck-exposure of dentine may give rise to indefinitely locating pains about the lips or jaws, in the neuralgic dentine, exposure at the neck of one tooth may be the cause of severe trigeminal neuralgia, with painful spots at the points of nerve emergence, the supra-orbital, infraorbital, and mental foramina; severe pain in the eye or in the ear. Cases are recorded when typical neuralgic sore areas have existed and resisted general medication, and been found due to exposed dentine at the neck of a tooth. This exposure may be upon any tooth; more than once it has been located upon the disto-cervical portion of a third molar.

In some of these cases deliberate irritation of the exposed dentine may cause a reflex paroxysm, but, unfortunately for purposes of immediate diagnosis, it more frequently happens that the pain induced is local. However, a casual relationship is made clear when it is noted that the reflex pain disappears soon after a thorough cauterization of the exposed dentine.

A diagnostic sign of the condition is the recurrence of pain upon taking faintly acid or intensely sweet substances into the mouth.

ACUTE DISEASES OF THE PULP.

While it is true that severe and wide reflex pains may be caused by acute hyperæmia and attacks of acute inflammation of the dental pulp, it is rare in these affections that symptoms directly referred to the maxillary region are absent.

In the first-named disorder the taking of cold water in the mouth is almost immediately followed by a paroxysm of pain, usually definitely located in the region of the posterior, middle, or anterior dental nerves. In acute pulpitis the pains are also directly referred to the maxillary region, although a defined sore spot may present as a reflex at some portion of the face or scalp, in which event the existence of a dental disease may not be even suspected.

It is in connection with repeated venous congestion of the pulp, its chronic inflammation, suppurative and non-suppurative, and still more frequently with the formation of defined calcific masses in the pulp-tissues, that wide reflex disorders are most frequently found.

All of these conditions present one common feature which differentiates them in symptomatology from the acute affections of

the pulp,—i.e., a lessening instead of an exaltation of the special temperature sense of the pulp. Black has remarked this in his contributions to the "American System of Dentistry," and it will be found almost constant. The reaction develops a special peculiarity, notably in the later stages of some of these degenerations, and that is a lessening of response to cold application and an increasing response to heat.

The nature and time of response to heat affords a valuable diagnostic sign as to the pathological condition of the pulp. It is most marked in abscess of the pulp, less so in venous hyperæmia, and much delayed in extensive calcifications in the pulp substance. These distinctions may be carried to still further differentiations, but are beyond the scope of the present paper.

The vast majority of the common neuralgias, with defined painful areas about the head, are due to one of these dental disorders. Pain in front of the ear, in the ear, pain over or in the eye, with a disposition to press upon the eyeball, tender spots in the occipital region, or in most of the cases of pain at the points of nerve-emergence, all point to a reflex disorder having a dental origin.

In nearly all of these cases pain is unilateral. Should it be found upon both sides of the head, it leads to the suspicion of teeth on the other side being affected or to the existence of some optical defect, notably uncorrected astigmatism, hyperopia, or myopia.

Much confusion may arise through the existence of both dental disorders and optical defects, so that the general injunction of the ophthalmologist to patients, "Have your teeth examined," is reciprocal. The dentist should advise in neuralgic cases, "Have your eyes examined," but should correct or remove all dental disorders to which reflex neuralgias are attributable.

Reflex cranial and other neuralgias are also associated with diseases of the pericementum; the classes of pericemental affections giving rise to them are both septic and non-septic. As with pulp-diseases, reflex neuralgias are most commonly due to chronic rather than acute pericemental diseases. Of the non-septic cases, a hypertrophy of cementum has been found a frequent cause of some of the most remote cases of reflex neuralgia recorded in medical and dental literature.

As with nodular deposits in the pulp, these growths exist frequently, and give rise to no symptoms whatever; presumably, the reason for reflex irritation when it appears is the pressure of the hypertrophic growth upon nerve fibres. Many of these cases are

not diagnosed except by a long and tedious process of exclusion, there being frequently no local symptoms which would point to the existence of the dental condition. At the present day, suspected cases would, of course, be unveiled through a radiograph.

Many reflex neuralgias are directly traceable to the existence of septic conditions about the roots of teeth, the proof of the casual association being brought to light by the disappearance of the reflex disturbance when the septic condition about the root is remedied or the tooth is extracted. Indeed, it is extremely probable that a large class of ill-defined disorders might be traced to this source, the lack of continuity and clearness of histories, dental and otherwise, obscuring the connection between dental and other diseases.

This subject might be expanded into a large monograph, even more extensive than Brubaker's admirable contribution to the "American System of Dentistry." Enough, however, has been said to emphasize the direct and indirect importance of dental health and to furnish material for an evening's discussion.

REMOVAL OF THE DENTAL PULP.¹

BY DR. B. HOLLY SMITH.

"In proportion as medicine has grown scientific and skilful less dependence is placed on the therapeutic effects of drugs for the alleviation of human ills. Secondary effect has assumed greater importance, and possible evils attending administrations have outweighed the advantage of immediate relief.

"For more than half a century practitioners of dentistry have relied upon the application of arsenous acid to the dental pulp with a view to its destruction. Has any one found the exact limits of the destructive power of that agent? Has the use of this material been attended with no secondary evils? That pericemental disturbances do frequently occur can be stated without fear of dispute; that arsenic may be the cause has long been the thought of the writer, an opinion formed through observation of the contrast between teeth made pulpless through surgical procedure pure and simple and those from which the pulps have been

¹ Abstract of paper read before the National Dental Association, Omaha, 1898.

removed after the application of arsenical preparations. The well-known germicidal qualities of arsenic would indicate that no trouble should be expected from the contents of the tubuli which have been subjected to arsenical application and sealed from the chance of subsequent infection; yet trouble not infrequently does arise in after years, even where there is reasonable certainty that the apex was entirely closed.

"Why? Is it possible that a sleeping volcano has been located in the apical space by the application of arsenic? that the effect of the agent has not been limited to the confines of the pulp-canal and dentinal tubuli? that the area of tissue affected breaks down in seasons of depressed vitality, or becomes infected through the medium of the circulation? The apical opening may be infinitesimal, but it must be large in comparison with the tubuli in the dentine. Why may not the nerves and vessels in the apical space and a considerable area of the pericemental membrane have a share in the action of the arsenic? There is no positive evidence of a well-defined line of demarcation in the effect. Even after the agent passes the point where it has power to destroy, may it not deplete and incapacitate the tissues until danger is invited and may subsequently follow?"

Dr. Smith then quoted from Dr. J. Foster Flagg (1877), on the effects of arsenic taken into the circulation; from Arkövy, on the inflammation concomitant with the dying of the pulp; and from • Dr. Burchard's recently published work, "Dental Pathology and Therapeutics," on the specific action of arsenic; from Dr. I. P. Wilson (1888), on its effects upon the cementum; and from Dr. Kirk (1898), on inflammatory action and bacterial invasion; thence deducing an explanation of the pathological expressions occurring in the apical space of teeth which have been treated with arsenic, drawing the conclusion that arsenic should no longer enjoy its universal popularity, but should give place to surgical procedure.

A change in this respect involves not so much the absence of other means as an aversion to change of practice, and the well-fixed habits of treating teeth without charge, giving two hours to filling a cavity with gold and five minutes to the destruction of a pulp. If, as we claim, we are dental surgeons,—not mere cavity-stoppers,—this is not right, and must be changed.

The conditions essential for pulp-removal by operative procedure were then considered, and the method of treatment outlined as follows:

"To the dental surgeon, as to the general surgeon, the necessity

for operative procedure must be evident, and the field of operation be in as favorable condition as can be obtained. No effort should be made to remove a pulp in a high state of inflammation; employ antiphlogistic agents until irritation has subsided.

"Flood the cavity with a tepid solution of bicarbonate of soda. Then close the cavity with a pledget of cotton saturated in cocaine hydrochlorate for a few moments, avoiding pressure, and taking great care not to cause pain. Adjust a concave disk of vacuum-cavity material so that its edges will impinge upon the walls of the cavity and prevent pressure. Under this disk place a pledget of cotton saturated with oil of cloves. Cover with temporary stopping, paint the gum with aconite and iodine, equal parts, and dismiss patient until one or, preferably, two hours can be given to the operation of removal, when, if conditions are favorable, the pulp may be cocainized with the electric current and removed, using a minimum amount of current and a saturated solution of cocaine.

"If cataphoresis is not successful in the highest sense, supplant by a general anæsthetic, preferably nitrous oxide.

"When teeth containing living pulps are to be excised or ground down, advantage can be taken of the opportunity to remove the pulp under the influence of the shock of excision, which can be done with no pain. Cut the enamel with the disk or bur, leaving for the forceps only so much as will not require stress or violence. Having ready in the engine a cone-shaped bur, clean and sharp broach, etc., remove the pulp immediately by passing the broach quickly to the apex, twisting the pulp out in toto.

"The most inviting field for the surgical operation is found in single-root teeth, but it can be employed in the molars if the effort is painstaking. Surgery is not only more scientific, but is also proved to be more successful. A plea for this change in method should therefore not pass unheeded."

WHAT INSTRUMENTS SHALL I CARRY?

BY J. T. CODMAN, D.M.D., BOSTON, MASS.

A CALL came last night after midnight. A gentleman was suffering from toothache. He was a stranger at a hotel. Would I call on him and try to relieve him from pain? My first impulse was to say, No; if he wants my services let him come to me or

wait until morning. But my second thoughts said, Wherefore am I a dentist, except it be to relieve pain? Is not that my highest professional duty? And I also remembered the injunction, Be careful in your entertainment of strangers, etc.

I dressed. It rained. Cars were not running. The messenger was gone; I could not question him. What was the trouble with the stranger? Had he an exposed pulp, simple periostitis, an abscess to be lanced, an old trouble from pent-up toxic matter, or new and suddenly violent inflammation of a pulp? And has the difficulty progressed so far that it is necessary to extract the tooth? I must be prepared for any emergency. If the gentleman were in my office, I could be sure of having at hand all appliances for any case. I judged it was probably pain from an exposed (diseased) pulp, and I gathered an assortment of instruments and appliances to take to his relief.

That was the only thing I could do. I could not take all in the office. I had no list made out. I must remember and recall all the things I have usually needed on similar calls. Why not have a list on hand? I will make one, and it will serve for future use. When I returned from my call I was more in favor of it, for I had left behind something it would have been best to have had by me.

This is the list I have made out, and as it may be useful to some professional brother (or sister) who has been awakened from a sound sleep some time, and required to put his ready wits to work searching among his multitudinous instruments for the right things to carry with him to the sufferer, I present it to the JOURNAL.

EMERGENCY CALL LIST OF INSTRUMENTS AND APPLIANCES.

- 1 mouth-mirror (or two), to throw light.
- 1 explorer (or two), to search cavities.
- 1 large cutter (side) } to break edges and to open cavity.
- 1 large cutter (end) }
- 1 (or two) long, smaller side cutter } called excavators, to clean
- 1 (or two) long hoe excavator } and partly excavate
- 1 short side cutter } cavity.
- 1 short hoe excavator }
- 1 pair foil-tongs (always necessary).
- 1 water syringe (convenient).
- 1 knife file, or separating files (not always wanted).
- 1 half-round, medium-cut file, for shortening bite.
- 1 root instrument, for reaching into roots.

- 1 gum-lance. (Have a sharp knife in your pocket.)
- 6 small mouth-napkins, to dry with.
- 1 wad of cotton or absorbent fibre. (Do not forget it!)
- 1 spool floss silk or thread, to tie pledget in (sometimes).
- 1 pair scissors, to cut silk.
- 1 bottle sandarach varnish, to protect cotton filling.
- 1 bottle nerve-destroying paste, to kill pulps.
- 1 bottle 1, 2, 3 compound or cocaine, or any good obtundent.
- 1 small bottle toothache drops, to leave behind with patient.
- On a chance of being obliged to extract an aching tooth, carry

the following forceps :

- 1 pair upper wisdom.
- 1 pair under wisdom.
- 1 pair upper bicuspid.
- 1 pair under bicuspid.
- 1 pair upper central and cuspid.
- 1 pair under central and cuspid.
- 1 elevator. (Use your own kind.)

The wisdom forceps may, in an emergency, be used for all the molars; the bicuspid forceps for the canines. If not, use the central forceps for them and the remaining teeth.

Put all these implements into a small, neat hand-bag, with a clean towel, and, if room, add your thinnest office-coat, for comfort. Bring back all your instruments, etc., and your fee, if you can get it,—cash.

I have here made a list of about the smallest number of instruments, etc., that I would like to start out with at an unseasonable hour. In the daytime we may perhaps find what we have forgotten to take with us at a neighboring apothecary's store, or at some brother dentist's. If we are called to a private house and have left our cotton behind, we may find some there, or an old piece of cotton cloth, which may do, poorly, to form napkins of; but I modestly propose that this list of mine be copied and securely placed for reference where it can always be found. Each dentist may then subtract or add any other things to the list that he may prefer, or change some of them to those better suited to his fancy or individual taste.

REMINISCENCES OF A EUROPEAN TRIP TO THE INTERNATIONAL MEDICAL CONGRESS AT MOSCOW, RUSSIA, AUGUST 19 TO 26, 1897, AS A DELEGATE FROM THE AMERICAN MEDICAL ASSOCIATION AND THE ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.¹

BY W. G. A. BONWILL, D.D.S., PHILADELPHIA.

(Continued from page 667.)

IN Paris I was the guest of Dr. Amoedo, where for eight days I was in constant motion, not having a moment to spare either to enter any of the galleries of fine arts or to revel in the gayeties of this gayest of cities.

I saw much of Dr. Amoedo's practice, being frequently in his office. I was surprised to find him having so many antrum cases for treatment. I did not ask whether they were his originally. Whether he was successful in the treatment I could not ascertain. I should not want such a practice from others, nor would I wish to think they had resulted from my own bad dental operations. To me the number treated seemed large, as I have had but two cases in my practice in forty-three years, and those from the hands of others. His treatment was aseptic, and he had around him all the paraphernalia for the most complete carrying out of the mandates of Pasteur. I laughed at the doctor for wearing in his office and for every patient the same coat he wore upon the street. This is certainly objectionable, but he was not alone in this style of dressing.

While there an opportunity was given me to assist him in making a full set of plain teeth in my articulator, and which he, after several efforts, succeeded, to my delight, in accomplishing. I was pleased to help him, as that is the only way in which I can ever hope to teach any and all men this wonderful law of nature.

I have him to thank for marked attentions while at the Congress, and also all along the route from Moscow, he being familiar with three languages.

It was in Paris I came into contact with more American dentists than at any other place visited.

The profession here is split up into three sections and many cliques. The first to honor me was the French Odontological

¹ Read before the Odontological Society of Pennsylvania, March 12, 1898.

Society and School of Dentistry, with Professor Godon at its head. I lectured here to a crowded audience, on a very warm night and in close apartments, but they held together for two hours or more. Both Drs. Bogue and Amoedo acted as interpreters. The lecture included a synopsis of many of my methods of practice, and showing of special instruments. They especially desired an explanation of articulation by the large charts which I had brought with me from home.

Frenchman-like, many questions were asked, and it was evident that they knew something of my system and methods. The French dentist is full of energy and soul, and, while they are handicapped by their patients' desire for painless operations and plastic fillings, they are men of culture and standing, and hold their profession in high respect; and they move in social circles where ability is recognized, even though the dentist has to use his hands to obtain his living.

Taking Dr. Lecaudey as a true type of a man and dentist, we find him a member of the Legion of Honor, and through his intervention Dr. Michaels, an American dentist, was also made a member of the Legion. Dr. Lecaudey uses all his influence to forward socially and in every way the highest interests of the dental profession everywhere, and seems to be as much of a friend to the American dentists of Paris as to the French. He has always given me a dinner when in Paris, and shown his willingness to help in all possible directions.

The French School of Dentistry building was undergoing enlargement, and I was shown the drawings of the architect, whom I met when looking at the progress made. Unfortunately, they had made a mistake as to the light, which was easily demonstrated to them by placing a patient in a chair, and putting both in position to catch the light as they had arranged. The mistake was obviated at once.

The French medical dentists invited me to address them at Dr. Hugenschmidt's office the last Sunday I was in Paris, where Dr. Hugenschmidt acted as interpreter most satisfactorily; four hours were spent very pleasantly by me, and they exhibited their good breeding by close attention and every mark of respect.

Those holding the French D.D.S. and the French M.D., D.D.S. constitute two distinct societies and keep separate, although Dr. Hugenschmidt seems to be able to go to all the societies in Paris, being a man of extremely polite manners and marked intelligence, and careful of the feelings of others. I speak of him be-

cause I have known him so long, and his courtesy is always extended to me when in Paris. He is one of the moving spirits among the French M.D., D.D.S.

Dr. Godon is the most active member of the Odontological Society and School of Dentistry, and is an able and good fellow, and has his warm friends among the American element there. I cannot speak of each person individually, as time will not permit.

My last evening in Paris was spent with the American Dental Club, when they insisted upon my talking on every subject I am familiar with, consuming two hours or more. The discussion was voted over to the next monthly meeting, when the subject of laws of articulation was to be handled without gloves by Dr. Michaels and others. It required this and two subsequent meetings to finish the discussion.

A copy of the proceedings was sent to me, and Dr. Michaels seemed to take special delight in trying to tear the instrument to pieces, and said it was not amenable to any law, and he could do as well with a plaster articulator.

To sum up the opposition talk, I simply state what Dr. Bogue wrote me: "Bonwill, we took care of your laws and work, and, with all that could be said in criticism, you may rest assured you stand secure in your instrument's work and the laws underlying the mechanism of the human jaw."

The French and the Americans have always given me a good send-off, and I trust I may long keep their respect and love.

A pressing invitation was given me to attend the next (second) International Dental Congress in Paris in 1900, where at the same time the next International Medical Congress will meet; to which I replied that by that time, should I live and appear at the meeting, I hoped to tell them and show that I had entirely done away with gold as a filling-material in the human teeth, to which they all said, "Amen! so mote it be."

I found the amalgam question stirring the elements of each society, as well as the plastics, and, if possible, less gold-foil was being used if financial profit could be made by the change.

Cataphoresis was talked about, and should find a footing in Europe, and especially in Paris, since pain is so much dreaded, and it will no doubt be tried. But when the time consumed in the dental chair, which is as much dreaded as the operation, is taken into consideration, I think it will not stay very long. *I read them my paper on Cataphoresis, and how I had used the simple galvanic current from 1866 to 1869, and deadened sensitive dentine, extracted pulps,*

and also teeth, but how a little incident, when using it one day, caused me to abandon it for something which I have now used with perfect satisfaction for thirty-five years.

The laws regulating dentistry are growing more and more stringent, to the exclusion of the American dentist in France; and in every country in Europe the feeling grows apace to protect the native D.D.S. against any other country. It is only those who can stand a rigid examination and two years or more additional study in the schools of the kingdom or empire who can expect to remain or get into a European practice.

But it is right, as I said before, when we in every State have an Examining Board, and, no matter where graduated, must withstand their rigid examinations. In many respects this is fair, yet it works hardship against some who are competent to practise, but who are not able to answer the questions often put to them.

I know of a young student in this city who was thrown in his third year on such a foolish and irrelevant question as this: "What are the principal muscles engaged in the act of sneezing?" The young man was of the highest moral character and otherwise practically competent as an operator and in the laboratory.

We are forcing too many young men, such as they are, through our dental institutions, and the outlet, as heretofore, in foreign countries, will now be stopped, and we will have this half-educated element on our hands at home.

The eight days in Paris were completed, and, as I said, I had had no chance to have any fun. No one can leave this city without a regret that he has not seen everything in it.

As to the social side of my Paris visit, it was but a repetition of what had already been done for me, reviving the feeling that the labor had not been in vain, and that this special visit was not lost upon unappreciative audiences.

The meeting of the American Dental Club was at Dr. Bogue's, where, although late in the evening, a handsome dinner was given us. In this, as on all my former visits to Paris, Dr. Bogue has given me special consideration. Several of my old American friends were out of town. I saw much of Dr. Michaels. For some reason I could not make him feel I had anything new mechanically; he felt he had filled the whole bill. As to articulation, I was, in his opinion, far off the track. He did think I had a good thing in the dento-surgical engine, and went with me to be introduced to Professor Péan, the leading surgeon of France, and we took with us the surgical engine for his inspection.

They had in the hospital an apology for such an instrument, but, as I told them, it was only fit "for sawing wood." When Professor Péan had witnessed the work accomplished by my engine, he wanted one for his private and hospital work.

My stay was too short to enable me to visit many of the dentists at their private offices, yet I was shown every courtesy in a social way at lunches, dinners, etc., and in opportunity to examine their practice in the mouth.

I spent an evening with Dr. Michaels in reviewing some special work he had been doing in artificial limbs in connection with living tissue in supplying a substitute for the arm screwed into the living bone. He has been largely engaged in special hospital work, although he finds time to practise dentistry. He is very ingenious in this kind of work, but he was rather off his guard when he criticised my discovery of the laws of articulation. He was not up in mathematics or geometry as applied to the human frame, and, though famous as a member of the Legion of Honor, he showed in his criticism at the club meetings he was ill prepared to meet the question, and that there was more in the laws than he had calculated. "He is a good fellow for a' that," and I have him to thank for his close attention. The French are making every exertion to place their school on a higher plane, and to help to ennoble the profession and have its social status well recognized.

They are already planning for the Second International Dental Congress, which will meet here in 1900, at the same time the International Medical Congress will hold its sessions.

While the French dentist is not very fond of the American dentist, yet they extended to me every courtesy and considered me a cosmopolitan.

Any one can have a good opportunity for enjoyment in Paris if he is not too exclusive. We are as exclusive and selfish as any to be found anywhere in the ranks of professional men, and we have no cause to feel aggrieved at the treatment of the "American dentist" throughout Europe.

Dr. Thomas Evans was not looked upon as a dentist of a high type. It was his social intercourse with crowned heads that largely made his reputation. When I was in Paris in 1889 I called upon him. He refused to see me. His valet told me that as he did not use the machinery of modern dentistry, he would not see me because of my inventions. From what I could learn, he never operated other than by hand-pressure. Never having been in his office, I could not vouch for it, yet I believe it to be true.

It is largely true here, as all over Europe, that the French are very easily hurt. They will not tolerate pain nor an operation which inflicts it, and consequently the operator cannot have that chance to perform operations as his judgment would dictate, so he is at once handicapped. If cataphoresis can be of any avail, then it should go into use largely in Europe.

As to fees, there is no place abroad where higher prices are commanded, except, perhaps, in London. But their system of charges and making very short engagements with their patients must be abortive to that perfect system of practice which can only come through taking more time and longer sittings.

Until they are fully abreast with contour work we can never see dentistry advanced in the art of filling teeth. Gold crowns must come in to fill the breach, to the everlasting disgrace of *modern dentistry*, but the craze is no greater or wider spread than among our own "high-toned American dentistry."

Yet there *shall be a limit and a halt* to such false art and mechanism, for soon the day *will dawn* when it will be among "the things that were,—a school-boy's tale, the wonder of an hour;" when anticipation of decay, closer watchfulness to its limitation, the preparation of cavities to prevent recurrence, less gold, more plastics and the better how to use them than is done at present, and, not least, the *abnegation of self* and charge not for the material used, but for the *brains* put into it. In other words, *charge for a gutta-percha filling the same as for gold if it will be the safer*. Do this, and *all will be elevated!*

(To be continued.)

Abstracts and Translations.

ABSTRACT OF THE REPORT OF THE COMMITTEE ON FOREIGN RELATIONS OF THE NATIONAL ASSOCI- ATION OF DENTAL FACULTIES.¹

TO THE PRESIDENT AND MEMBERS OF THE NATIONAL ASSOCIATION
OF DENTAL FACULTIES:

The special committee on recognition of degrees in foreign countries and the comparative value of foreign degrees in this country, appointed at the last meeting of this Association, begs leave respectfully to report as follows:

The scope of the investigation of the committee has been somewhat changed from that which would appear to be indicated by the announcement in the published proceedings. It should not be forgotten that there are really no foreign degrees in dentistry, the nearest approach to this being the licentiate in England. America is peculiar in having a distinct and separate diploma for the graduates of distinctly dental colleges. We cannot hope for the recognition of this distinction until our course of instruction is fully comprehended in Europe, and the reputability of our degree established. The report of your committee, then, will specially consider the preliminary steps which we believe it proper to take before commencing further agitation. The subject is of the deepest significance, and involves our whole system of education. There can be no mutual recognition until there has been secured some common ground on which the profession of the various countries of Europe and of America can meet. At present the systems are too diverse, and involve too many seeming contradictions to allow any real reciprocity. Yet that is a consummation devoutly to be wished, and certainly we in America should spare no pains in the endeavor to bring it about. Hence the appointment of a committee to take the subject into consideration by the supreme authority in matters educational among us was doubtless a wise movement, and one which, in the opinion of your committee, should be persistently followed up. Indeed, the committee has received many letters highly approving of the action taken, with the promise of a hearty co-operation on the part of American dentists resident abroad.

¹ Made at Omaha, Nebraska, August 29, 1898.

That this body may act intelligently, it seems necessary in this report to review, as concisely as is possible with thoroughness, the real situation, with the view of securing a better state of affairs.

It must be remembered that scholastic dental practice, with the separate teaching which has been found necessary, is of quite recent origin. The first distinctive dental school was established in America in 1840, less than sixty years ago. For more than forty years all didactic and class instruction was confined to this country. Within the past twenty years dental schools have been organized in some of the countries of Europe, usually in connection with hospitals, for the purpose of securing clinical instruction and material. There has never been any reciprocity between the schools of the two continents, if we except the recognition temporarily accorded by England to the dental departments of Harvard and Michigan Universities. The conditions obtaining in the two continents too widely vary. The one is long settled, possessing the real erudition that can only be found in nations that have a past, but imperatively dominated by the traditions and precedents which are the natural outgrowth of heredity. The other has been a new country, with no educational or other institutions hallowed by centuries of growth and progress, and possessing the weight of ancestral influence. In the settlement and development of this country our people encountered obstacles totally unknown to the older states of Europe. Precedent there was none to guide, and tradition there was none to influence. The problems which confronted them were conditions existing, and not theories for consideration. The forces of nature were in one sense our foes, and not our allies. It was necessary first to overturn and reconstruct that which nature had already constructed. The struggle to accomplish this made of us a practical, inventive, ingenious people, who care mainly for ends and little for methods, while Europe respects no practical accomplishment that is secured through irregular, unacknowledged methods.

All these matters are reflected in the status of the dental profession here and abroad. Europe cannot be brought to believe in a practice not founded on a liberal preliminary education, while we are, as a whole, too careless concerning antecedents, so long as anything practical is assured. In Europe, if a man has a university education he is popularly supposed to be competent to practise any profession,—law, medicine, divinity, or any of the specialties,—any distinct instruction being required only to make him acquainted with the tools that he must use: The university degree is sup-

posed to include everything lesser, and hence there is no necessity for any other, that comprising all.

We in America have instinctively recognized the desirability of a university training by founding many schools without sufficient endowment for their independent support, thus really cheapening the university course. This has been through the endeavor to extend educational facilities to the masses, here again looking towards ends and not means.

The natural consequence of all this to our profession has been that in America to-day are probably found the best-skilled operators and the highest development of practical work, while in erudition we are in the rear of several European countries.

It may thus be seen that it is difficult to find a common ground on which the professions of the Old and the New World can stand in equality. Europe will tolerate nothing that does not bear the stamp of regularity. We are satisfied with anything that accomplishes the end sought.

The curricula of the schools of the two continents materially differ. But that could be overlooked, or they might be harmonized. The essential variation lies in the methods or way through which admission within the ranks of the profession is secured. The old countries jealously guard the doors of entrance. We throw them wide open, or, at the best, erect a barrier that is too easily overleaped. Europe declares that the learned professions must be reserved for the learned classes, and that any who enter must come through the door of a liberal education. We urge that the only sufficient qualification is fitness and practical knowledge. Europe will never come to our stand-point. Can we, or should we, attempt to reach hers? In the process of time this may undoubtedly be brought about. Already in America we see the effect of a comparatively low standard of requirements in the overcrowding of the professional ranks, so that they are losing their distinctive respectability and status, and with that their influence for good is circumscribed. Should this acceptance of the professional tone continue for any length of time, there will be no distinction between the professions and trade. Indeed, we find to-day many who contend that no line of demarcation should be drawn. Colleges of law, medicine, and divinity, with their specialties of dentistry, pharmacy, etc., are so multiplying that the consequence must eventually be self-destruction and the annihilation of all professional sentiment. A limit must be placed on the number of schools, and this can only be done by raising the professional standard to a point that will

shut out unworthy and unqualified colleges and their students. When this is done, and our preliminary educational standard is sufficiently advanced, with our practical methods and operative skill we shall be prepared to force the profession of Europe to come to our standard, if we are in advance of them, while if they are ahead of us we will be equally bound to reach their level. Even as it is, we are fast approaching each other, they growing more practical and we more erudite. To hasten the desirable end, in the opinion of your committee, this Association should endeavor to secure the co-operation of our *confrères* of the different countries by some official reciprocity, and we believe that the best method to accomplish this would be through the appointment of a standing committee on foreign relations, whose duty it shall be to make us better acquainted with European educational methods and curricula and to inform them of the advantages of ours. This might smooth many of the asperities and remove many of the prejudices which work to the detriment of both at the present time.

The second matter referred to this committee involves our relations with our American *confrères* living and practising abroad. This is closely allied to the subject already considered. American dentists practising in Europe have bitterly complained of the granting of the peculiar American degree to those who are in foreign countries considered unqualified. There is no questioning the fact that this has been done in the past. The time once was when foreigners flocked to our shores to complete their dental education by an American course of study, and by the securing of an American degree. This was materially checked by irresponsible institutions which conferred their honors too indiscriminately. The American degree was fast falling into such disrepute that it became necessary to do something, and accordingly this national organization of teachers was formed. I need not enlarge upon its great accomplishments. But unfortunately it was not conceived soon enough. Cause for reproach had already been given, and Europe has not hesitated to take advantage of it to her own benefit and in her own interests, and hence the D.D.S. does not now receive the consideration to which of right it is entitled, nor has sufficient credit been accorded to the work of this Association. It takes a long time to live down the bad reputation that may be gained in a day.

Two things are charged by American dentists practising in Europe,—

First, That students from the old countries are received by our

schools and given advanced standing on the presentation of certificates in foreign tongues which are really worthy no consideration whatever.

Second, That diplomas are practically sold by American institutions and degrees conferred *in absentia*.

There is, unfortunately, no disputing the fact that our *confrères* abroad have sometimes had cause for complaint that the value of their diplomas has been depreciated, and that they have not been sufficiently protected by the schools granting them. Even since the organization of this association of colleges its rules governing the admission of students have been violated on different occasions, through ignorance of the value of some of the certificates which the regulations have made necessary for advanced standing. It is also more than probable that worthless and even fraudulent certificates have sometimes been used as pretexts for giving advanced standing in certain American colleges, when their real character should have been well known by the authorities. A foreigner who desires an American degree, and who occupies but a low social position at home, procures a certificate from some unqualified source, perhaps under false representations. It is written in a foreign tongue and sealed with some pretentious seal, possibly that of an emigration or other bureau. This he presents to the American college, assuring the authorities that it represents a definite course of dental study. The dean is perhaps unable or indisposed to have it verified, and it is accepted, the applicant under it is admitted to the senior course, and graduated at the end of a single term. Thus, after an absence of but a few months, the student, perhaps a servant or a barber's apprentice who had become possessed of a little money, returns to his native land and flourishes in the faces of his former associates a diploma that should be the distinguishing characteristic of an educated man, and claims to be the *confrère* of those who have honestly earned a certificate of fitness from an American school, and upon whose diploma this unmerited scandal and disgrace has thus been brought.

It is possible that the institution thus offending may have been nothing more than careless. It would take weeks to verify the certificate presented, and then it would be too late for entrance. There are no means at hand by which the value of the document can be ascertained, and so the applicant is given the benefit of the doubt and admitted to advanced standing.

Formal complaint was last year made by American dentists in Switzerland in the case of a student who was admitted to the

Senior class of a college having membership in this body. He had been permitted to join upon the presentation of a foreign certificate. Culpable negligence seemed to have been exercised, and had it not been for the energetic protest of our *confrères* abroad the student would have been graduated at the end of a few months. Upon the presentation of the case the college reduced the student to the Freshman class, and he must wait for his diploma. It is further charged that he was matriculated when not in this country, the date of the closing of the time for registration having expired before his arrival in America. Such cases as this should be closely investigated, that the offending college may be punished if guilty, or exonerated if innocent.

. It has appeared impossible in many instances to determine the character of the certificates presented. The foreign school, or pretended school, is unknown here. We have no list of such, and great injustice might be done to applicants if the document is refused, provided it be genuine and sufficient. But it is quite proper for every college to insist upon the endorsement of some known authority. If, as it now is, the authorities are conscientious in the matter and ask for a verification of the document presented, the prospective student perhaps brings a countryman who is suborned to give a false interpretation of it. Or he goes to a rival school, representing that the first to which he applied, and which calls for the additional testimony, had accepted him, but that he had found the college to be inferior to its neighbor, and so he wishes to transfer his matriculation to a better one. That appeals to more than one perverted sense, and he is accepted on his mere assertion, skillfully made, that the document had been approved by the other institution, and is given advanced standing.

As for the determination of preliminary qualifications, that is a yet more difficult affair. The systems of general education in different countries are so diverse that it is almost an impossibility to decide what may be accepted as the equivalent for the standard of the National Association of Dental Faculties. And so the reception of students from abroad is a matter in which the most conscientious dean may be at fault.

This condition of affairs has long existed. It forms the basis for many bitter complaints on the part of both foreign and American dentists practising abroad. It very loudly calls for reform, and to your committee it seems that the good name and reputation of this Association is concerned, and that we are in honor bound to seek some remedy.

The communications from abroad that have been referred to this committee suggest that a board of European dentists should be appointed by this body, who shall take cognizance of such cases, and whose endorsement of the status of a proposed student shall be necessary for his matriculation in any recognized college. To give to such a foreign and irresponsible board plenary powers in the acceptance of applicants for matriculation from abroad is of course quite impossible. We have no legal or moral right to delegate the authority that has been by law vested in the responsible faculties of our colleges. In some of the States the determination of the qualifications is vested in State authorities, and they could not and would not delegate it to any board whatever. In the State of New York the college officers have nothing whatever to do with the determination of the preliminary qualifications of applicants. They must obtain from the State Regents a dental student's certificate before they can be accepted.

But your committee can see no objection to the naming of an advisory board, whose endorsement of any paper and whose certificate of educational and moral status may be considered sufficient, and it therefore recommends that not more than three qualified persons, resident in each of the principal countries of Europe, be appointed as an advisory board, to whom students from abroad may present their certificates of qualification and moral character for endorsement, or to whom the papers of students from abroad concerning which there is doubt or uncertainty may be referred for authentication and approval. Your committee was advised that this matter would be brought before the American Dental Society of Europe at its meeting in London, August 1, and that the chairman would be apprised of any action there taken.¹

The second cause of complaint that has been urged before your committee is that some institutions with high-sounding titles and names, and which are perhaps endorsed by State officers as having legal status, practically sell their diplomas abroad. This complaint is also one of long standing, and your committee believes that it is well founded. The condition is one for which, however, this Association is not responsible. Yet it seriously reflects upon American educational institutions, and is a source of scandal and

¹ Since this report was presented and adopted the chairman of the committee has received an abstract of the proceedings, in which was recommended the very action taken by the National Association of Dental Faculties at its late annual meeting.

opprobrium which cannot be ignored by it. In foreign countries the embarrassments of the situation are not comprehended. Under all the European governments it is possible to enact a general law that shall be effectual. We have nearly fifty separate States, each autonomous so far as its domestic affairs are concerned, and all educational matters belong in that category. Hence one State may enact a law under which it is possible to incorporate an institution essentially fraudulent in its character, and the other States are powerless to prevent or correct the evil.

The State of Illinois is a glaring example of this kind of vicious legislation, and nearly or quite all the fraudulent colleges are now located in the city of Chicago, to the great reproach of the State and the profession of dentistry within its borders. That city contains some of the very best of our professional educational institutions, and at the same time the most villanous impostures conceivable. Dentistry in Chicago can boast of as high-toned and eminent practitioners as are found anywhere in the world, and it is disgraced by some who appear to acknowledge none of the usually accepted professional obligations, while using the professional name to further their own illegitimate ends. Unfortunately it is sometimes hard for the uninitiated to tell them apart, for some of the latter have held responsible professional positions, and use that seeming endorsement in the pursuit of their illicit business.

Men unacquainted with professional educational affairs, who know not the wiles of designing tricksters who would take advantage of an innocent law to further their own selfish purposes, are not the best judges of what is proper legislation for the profession. In an unsuspecting moment, and without sufficient consideration, there was placed upon the Illinois statute-books an enactment which, while assuming to further business interests and honestly intended for their benefit, allows the incorporation under the law of associations that may carry on a fraudulent diploma business. So loosely or so nefariously drawn was this law that for the merely nominal fee of registration, amounting to less than five dollars, totally unqualified men may be permitted to issue diplomas of qualification in the different professions. This seems a monstrous state of affairs, but it has been suffered to exist for years. The citizens of other States are powerless, for Illinois is supreme within her own jurisdiction, and she continues to protect her criminals in their villany. The task of securing the repeal of this vicious law is too great for the courage of its reputable men, for ignorance and vice have struck hands in its maintenance. Even the excellent

and influential Illinois State Dental Society has looked upon this condition with seeming indifference. As a consequence of the continuance of this demoralizing law, a considerable number of the practitioners of Chicago carry in their pockets or exhibit on their walls college charters conferring upon them the power to issue diplomas in dentistry. A number of advertising offices are legally conducted under such names as "The Illinois Academy of Medicine and Dentistry," "The College of Painless Dentistry," "The Union College of Dentistry," etc., and, *mirabile dictu*, the certificate of the Secretary of State, under the great seal of the State of Illinois, can be obtained certifying to their entire legal respectability and status. It seems to your committee that the decent part of the profession of this grand State should begin an agitation for the repeal of this vicious law. It is earnestly to be hoped that as soon as the professional men of the State are aroused from their lethargy and made to comprehend the enormity of the condition, they will present the matter before the legislature in its proper light, and the disgraceful law will be so amended that it will not apply to educational institutions, and the charters already issued under it will be very promptly cancelled.

Some of the so-called dental colleges have no other existence than this State incorporation. They are owned and run by one man, and he, perhaps, sails under a false name. Of course, if they give no instruction whatever, and yet confer degrees, they are amenable to the law against fraud. But their diplomas are not offered at all in this country, being only advertised abroad. They know very well that if they attempt to ply their trade at home they will speedily be brought to grief, and so they permit no proofs of their work to come to light in America. There is no indication of their business at their published address, and any letters sent to them from this country are carefully left unanswered. Their work is done through European agents. We cannot locate them, and there are no proofs to be obtained in this country. Our *confrères* abroad complain bitterly of these swindlers, but they do not comprehend the situation, and when we ask them to obtain the proofs of their villany, they reply that the miserable affairs are under our immediate notice, and we should get the testimony here.

Sometimes our professional journals, and some of our prominent men, and even professional organizations, instituted for the purpose of regulating dental practice here, unwittingly further the objects of these men by falsely charging that respectable schools are practically engaged in the same business of granting irregular

degrees, and thus they efface the line of distinction that the reputable colleges have been striving to set up. It is a singular fact that nearly or quite every application which approved colleges receive for irregular degrees comes from Europe; and because of these miserable villifications of respectable schools by American dentists acting with more zeal than discretion, and more fervor than knowledge, there is not an American college that is free from these insulting applications.

This is the condition that confronts us in America. This Association has done what it could, and advanced as fast as it could. It has been embarrassed by the lack of co-operation, and even by the active opposition, of those to whom it had a right to look for help. It has been denounced because it has not taken the radical steps demanded by men who have little comprehension of the difficulties to be met, and who do not understand that the tone of the colleges and the profession as a whole can only be advanced by a movement that is made as a whole. At the most critical moment the ground that had been gained has been lost through the absolute refusal of some of the colleges to vote to sustain the most moderate requirements, and it may almost be a matter for astonishment that so much has been accomplished. This Association has sharply drawn the line between the reputable and the disreputable schools, and despite the fact that over-zealous and unwise men have been industriously engaged in effacing it, and confusing the good with the bad by claiming that all have the same character, in this country the distinction is well known. It should be, and, if these ill-advised strictures are abandoned, it will soon be, as well comprehended abroad. All that is necessary is to scan the list of the members of the National Association of Dental Faculties, and if the name of an institution granting a diploma is not found in it, that document is unacknowledged by this Association. If any college that has a membership in this Association grants a degree or accepts a student irregularly, the faith and honor of every other member is pledged to inflict the most condign punishment upon presentation of the proofs.

But it has been charged that violations of the rules have been committed by members without subsequent punishment. There appears to be an impression that it is the duty of the Association to discipline a college upon mere rumors and to inflict punishment without proofs. This would be the rankest injustice. There has never yet been definite charges made against a college by any responsible party, with accompanying proofs or positive information

where evidence could be found, without the most thorough investigation of the case. It has been charged before your committee that the case first cited was such a one. But in that case the implicated college corrected the error of its own volition. The remedy for infraction of our regulations thus rests in the hands of every respectable member of our profession; for so carefully has this Association guarded this point that it has appointed a committee with plenary powers for the express purpose of investigating charges of irregularity brought between the sessions, thus offering swift as well as exact justice.

As to the irregular colleges, your committee considers it the imperative duty of this body to employ every possible means for their exposure and suppression. We believe that it should protect the good name of American dentistry and American educational institutions. In this faith your committee, through its chairman, authorized the expenditure of a reasonable amount of money in the prosecution of investigations of unrecognized and irregular schools, and secured the co-operation of a thoroughly competent man for this work. As a consequence, considerable progress has been made in the unearthing of some of them. But it will probably take years of persistent effort to accomplish all that is desirable. We have received the most encouraging letters from our *confrères* in Europe, and have been materially aided by some of them. We have been assured that if such work is continued it must result in the higher appreciation of this Association in Europe, and in the perceptible raising of the estimation in which our degree is there held. Hence we feel warranted in urging upon you increased zeal in the prosecution of the work already commenced.

In view of all the considerations that have been presented in this report, your committee recommends the adoption of the following resolutions:

Resolved, That a standing committee of five be appointed each year by the president of this Association, to be called the Committee on Foreign Relations, whose duty it shall be to report each year upon the relative status of dentistry in America and Europe, and to suggest any measures that, in the opinion of its members, will promote the welfare of our common profession and the usefulness of the distinctive American dental degree.

Resolved, That the Committee on Foreign Relations be instructed to use its utmost diligence in ferreting out fraudulent or irregular colleges, and the granting of degrees irregularly by recognized colleges, should this be done, and to leave nothing undone within their power to bring to justice institutions granting irregular degrees or degrees irregularly. To this end this Association

authorizes the committee to expend any reasonable sum of money, which, if necessary, shall be raised by some fair assessment of the colleges of this Association.

Resolved, That an Advisory Board, to consist of not more than three qualified persons from each of the following-named countries of Europe, be appointed by this Association, to the member or members of which the papers of any foreign applicant for matriculation in any American dental college shall be referred for verification or endorsement, it being understood that such papers shall be referred to the member or members of the board appointed for the country of which the applicant is or has last been a resident. The countries to be represented shall be—1, Great Britain; 2, Holland and Belgium; 3, Denmark, Norway, and Sweden; 4, Russia; 5, Germany; 6, Austria and Hungary; 7, Italy and Greece; 8, France; 9, Spain and Portugal; 10, Switzerland and Turkey.

W. C. BARRETT,
S. H. GUILFORD,
D. J. McMILLAN,
F. D. WEISSE,
A. H. FULLER,

Committee.

The resolutions were unanimously adopted, and the committee continued as "The Standing Committee on Foreign Relations," J. D. Paterson being appointed in place of D. J. McMillan, elected president of the Association.

The committee was authorized to appoint the Foreign Advisory Board.

It earnestly invites the co-operation of American dentists at home and abroad. Letters should be addressed to W. C. Barrett, chairman, 208 Franklin Street, Buffalo, N. Y., U. S. A.

GOLD LININGS AND STRENGTHENERS FOR VULCANITE PLATES.¹

BY J. H. GARTRELL.

THE subject of lining and strengthening vulcanite plates is one that I have thought of sufficient interest to bring before you. It has doubtless had more or less attention from all who have given much attention to vulcanite dentures. Various experiments have been made since vulcanite was first introduced with a view of

¹ Read at the Annual Meeting held in Bath.

developing some process by which a durable gold surface may be produced on that portion of the rubber denture which fits over the alveolar and palatal portion of the mouth.

It will, I think, be generally admitted by those who have observed the effects of vulcanite upon the gums for any length of time that it seriously produces undue absorption of the alveolar process. The cause is, without doubt, due to the non-conducting properties of rubber, and in consequence the retention of undue heat. Some writers on the subject have attributed the deleterious effects to mercury-poisoning, but vermilion in combination with rubber when worn in the mouth is unlikely to produce injurious effects. It is not probable that this compound in contact with saliva is chemically decomposed and converted into a poisonous salt of mercury. Almost the last case I had to deal with before leaving home was to make a new upper continuous gum set for a patient who had worn a continuous gum set for about twenty years. I have the model of the mouth here, from which you may see that very little absorption of the ridge can have taken place in all that time. If a vulcanite plate had been worn during such a period I should expect to find the ridge greatly absorbed. Metal strengtheners for vulcanite plates have been generally fitted to the lingual surface, probably by way of ornament as much as to strengthen the plate. I have a set here which illustrates this method of fitting the gold to the lingual surface. In this particular case it would seem to be unnecessary to strengthen the rubber with metal, seeing the plate weighs over two ounces. As the patient wore this plate with satisfaction for a number of years, it goes to prove that weight is not of so much importance as the fit.

The method that has been usually adopted for lining the palatal surface with gold is to use gold-foil pressed over the model before finally closing the flask. To increase the adhesion to the rubber a modification of this method has been introduced in the United States, and known as "vulcan gold lining." It is a pure gold sheet covered on one side with a thin coating of silver. The idea is that the sulphur in the rubber, acting upon the silver, produces a condition of surface favorable to adhesion. This combination has proved a failure in my hands, as the silver in vulcanizing combines completely with the sulphur in the rubber, forming silver sulphide, from which the gold is readily stripped with the finger-nail. Tinning the surface of the silver will prevent this action; but after many experiments I have adopted a sheet metal composed of pure gold on one side and an alloy of silver and platina

on the other, similar to the metal known as dental alloy. The object of using platina in the alloy is to prevent the silver being converted to silver sulphide. This composite metal also differs from the American preparation in being much thicker and substantial, or a sheet metal of No. 2 gauge or No. 32 American gauge instead of a foil. It consequently requires to be swaged to form the palatal surface of a vulcanite set, and is a strengthener as well as a pure gold lining. The method of making this sheet metal is borrowed from the method of preparing the celebrated Sheffield silver plate, which is well known to be much stronger and more durable than electro-plating. A plate of pure gold is prepared, and another of the silver platina alloy; the two plates are placed together and heated to redness, when great pressure is put upon them in an hydraulic press. This process unites them into a solid plate, which is then rolled in a flattening mill to the required gauge. The proportions of gold to the silver platina alloy I use are one ounce of pure gold to four ounces of the alloy. This gives a strong and durable coating of gold, which retains the color in the mouth under all conditions; 22-carat gold has been tried, but oxidation of the copper in the alloy prevented adhesion with silver; aluminum and gold will not combine for the same reason.

To prepare a plate of this composite metal for lining a vulcanite set, a thin metal model is made, either by casting fusible metal into a plaster impression or by moulding a plaster model in sand and obtaining a casting in fusible metal, die metal, tin, or zinc. The first and second metals are preferable; fusible metal is more rigid to swage upon than tin. The die metal is an alloy of tin, twenty-four ounces; antimony, three ounces; copper, one and one-half ounces; zinc, one ounce; phosphor tin, one-fourth ounce. This metal is similar to Babbett, but much better. A piece of the sheet composite metal is cut to pattern and swaged upon the metal model in the shot-swager. Owing to its softness and pliability, a plate is easily and accurately swaged, taking only a few minutes. The gold side will, of course, be next the model. After the plate is swaged it has to be punched with slots around the ridge. The slots correspond to the position of wire attachments for a gold plate with the teeth mounted in vulcanite. The perforations are also made across the plate close to the posterior edge of the palate for an upper denture. I have designed a special punch for making these perforations; it acts by throwing up two barbs and curling them over at each end of the perforation, making a very strong

anchorage for the vulcanite. The punch may with advantage be used for securing vulcanite to ordinary gold plates, and save the time and trouble of fitting wire attachments in the usual manner. The slots may be made of different sizes by adjusting the screw fitted to the handle. In perforating the plate it should be held loosely in the hand to prevent warping. If this should happen, however, it is quickly corrected by swaging again with fine shot, which does not injure the barbs thrown up by the punch, as would occur with any other method of swaging. The subsequent process of combining these strengtheners with vulcanite in the plaster mould of flask is the same as with an ordinary gold plate, with the exception that the pattern for the mould for the palate is made of swaged sheet tin sufficiently thick for the vulcanite when taking its place to cover the silver or lingual side of the plate, the gold lining forming the palatal side.

The weight of a medium size plate of this composite metal for an upper edentulous case is about four to five pennyweights, and the cost, at forty shillings per ounce, will be about eight shillings. I have been making this work for some time with much satisfaction, and have a number of cases in use. The advantages are a pure gold surface in contact with the gums, a strengthener to the vulcanite, a more accurate fit than with an ordinary gold plate, and the easy and ready method of swaging the plate and making the perforations to combine it with the vulcanite. I am trying this metal now by covering both sides of the dental alloy with pure gold and rolling to No. 6 or 7 gauge for use as an ordinary gold plate with rubber attachments. The metal is easier and more accurately swaged than 18- or 20-carat gold plate, and keeps the pure gold color in the mouth under all conditions, and the layer of gold is so strong prepared in the manner described that I expect it to wear any length of time. As it can be supplied by the depots at fifty shillings per ounce, a plate will cost considerably less than ordinary gold plate at from seventy to eighty shillings per ounce. For lining and strengthening vulcanite cases as first described there is, without doubt, a future before it.—*Journal of the British Dental Association.*

Reports of Society Meetings.

NATIONAL DENTAL ASSOCIATION.

THE First Annual Meeting of the National Dental Association was held in Omaha, Nebraska, August 30 to September 2, 1898.

The meetings were held in the Creighton Medical Building, where ample facilities were afforded for sessions, section meetings, exhibits, clinics, etc. With the President, Dr. Thomas Fillebrown, occupying the chair, the meeting was called to order at 11 A.M., Tuesday, August 30, and opened with prayer by Professor J. Taft, of Cincinnati.

The mayor of Omaha, Hon. Frank N. Moore, in welcoming the delegates, alluded in a humorous manner to the many addresses he had been obliged to make, and then welcomed the dental convention to Omaha, and trusted the members would enjoy their stay in the city and also the Trans-Mississippi Exhibition. He presented the symbol of the freedom of the city in two massive gilded wooden keys.

These were accepted by the President with expression of thanks, who then called upon Dr. James Truman to respond to the mayor.

Dr. Truman said he voiced the feeling of the audience in thanking the mayor and, through him, the citizens of Omaha for their hospitable reception. He then briefly alluded to the progress made in dentistry in the past fifty years and the union of the two wings, North and South, the final culmination of which was being perfected at this meeting, and now we recognize no North, no South, no East, and no West, but united we aim to accomplish the work given us to do. He called attention to the fact that the State of Nebraska a few short years ago was the home of the wildest of the aboriginal tribes. These to-day were assembled here at Omaha in a Congress of Peace, one of the most interesting features of this great Exposition which had made Omaha famous throughout the length and breadth of the land.

In closing he said we cannot longer locate the West. It is not to be found at Chicago, neither at Omaha, nor at Denver, Salt Lake, Tacoma, Seattle, Portland, or San Francisco. It has passed out of the Golden Gate and centred upon the Hawaiian group; not

there, but facing the Orient, the flag of our country waves over the Philippines, the emblem of freedom, of intelligence, and of the development of humanity, and neither one power nor an aggregation of powers can lower it, for the West of this country is there to remain for the enlightenment of the nations.

The usual routine business was then taken up.

In offering the report of the Recording Secretary, Dr. George H. Cushing, the President spoke in feeling terms of the absence of this long-honored official. Dr. C. N. Peirce offered a resolution tendering a telegraph message of regrets to Dr. Cushing. The resolution was adopted and Dr. Peirce appointed a "committee of one" to carry it into effect.

The Committee on Credentials reported that certain States had ignored Section 4 of Article IV. in the election of delegates to this Association. On motion of Dr. S. W. Foster, it was resolved that the rule be strictly enforced.

On motion of Dr. G. V. I. Brown, the privileges of the floor were tendered to all delegates present who were ruled out from membership by the enforcement of this rule.

The Secretary read a communication from Dr. R. Ottolengui on the subject of amendments to the patent laws, asking the endorsement of the National Dental Association for this movement. The communication was referred to the Executive Committee, which subsequently reported unanimously the following resolution:

"WHEREAS, The Supreme Court having already declared all such patents as are contemplated in this move to amend the patent law invalid, which makes all such amendments unnecessary; and

"WHEREAS, The constant agitation of this question is detrimental to the best interests of organizations in existence; therefore be it

"Resolved, That the National Dental Association now in session disapproves of any further work in this direction, and recommends that the whole question be dropped as unwise and unnecessary."

The resolution was presented to the Association and unanimously adopted by that body.

Dr. B. Holly Smith, Vice-President from the South, taking the chair, the President then read his annual address, of which we give a brief abstract. Dwelling upon the value of organization as essential to the success of any movement in which the combined efforts of several individuals are desired, he said, "It converts the irresponsible mob into the disciplined and responsible army. It is the fly-wheel of progress, which gives balance to combined effort, brings up and pushes forward the laggard of conservatism, re-

strains the erratic flight of the exuberant enthusiasm of the reformer, gives steadiness to action, and makes advancement sure. It holds the special privileges of the individual subject to the will of the body for the good of the whole. Nations, peoples, and communities require formulated rules for their government and control."

He then traced the evolution of law, from the statute law, changeable by the will of the body which made it, to organic or constitutional law, requiring a more complicated proceeding to change it, common laws being those deduced from generally accepted principles, and not the result of legislative action.

Laws are the measure of progress. Good laws are not found in a corrupt age, while a cultivated and enlightened people will not tolerate evil laws. Applying these principles to our own professional organization, it will be found that our organizations of the past were as good as the material of which they were formed would afford. Our present Association will be no better than the culture and enthusiastic efforts of its members will make it. Constitutions will not furnish brains, culture, nor application; standing rules will not compel research nor write papers. Neither, on the other hand, can by-laws prevent the student from seeking out the hidden mysteries of nature. The things most essential to the success of our organization are brains, education, application, enthusiasm, and an unselfish devotion that will bring to and lay on the altar of science the best efforts of every member. "All that I have I give unto thee" is the motto of the truly professional spirit, and must be the governing principle of a progressive scientific body.

Professional relations must be governed by an entirely unselfish principle, and to live where life is controlled by it, regulated by good common sense, then no loss will come.

The President spoke of the two distinctly new features of our present constitution,—the creation of the divisions of the East, the West, and the South, a feature of cosmopolitan character, which must awake wider interest in the meetings, guarding against sectional control. The provision for the formation of branches is the second distinctively new feature, through the influence of which it may reasonably be expected that large numbers will become actively and permanently connected with the Association, working in harmony with it, who would not otherwise join its ranks.

It has made this National Association possible, bringing into harmonious action and sympathy the sentiment and energies of a reunited profession. Its practical and successful working has been

shown by the Southern branch during the present year, and repetitions of such success may be prophesied with branches working in harmony with and as parts of the parent body, forwarding their proceedings for publication in the annual volume of the Association; a complete record representing the scientific progress of the profession during the year will thus be furnished, to be placed on the shelves of the library of every member.

He spoke of the manner of securing delegates as perhaps too complicated, the refusal of delegates from other than State societies probably keeping many good men out of our ranks.

The true value of professional organization lies in the wider diffusion of knowledge, culture, and refinement, and a true professional spirit. Hence, open wide the doors and go out into the streets and by-ways and compel men to come to the feast. Giving is gaining, teaching is learning,—no one can get from another the full benefit of his thought and teaching until he has grasped the hand and felt the personality of the leader and teacher. Honor is accorded to those who impart their knowledge the most freely.

Of the future of the Association he said, "To me it appears especially bright and encouraging. Whatever of shadows may have hung over our profession in the past, whatever of evil may have attended on its way, whatever of prejudice, ambition, or adverse interests may still exist, there is light upon its pathway in the future. The passing through the desert must needs have been made, but now on the heights a radiant pathway lies before us. 'The spirit of the age is with it, and it is one with the potent forces that advance knowledge, shape thought, and mould the life of nations.' The future promises much for the increase of scientific knowledge, the advancement of professional interests, and the promotion of the welfare of humanity."

The Committee on National Museum and Library reported that having visited the institution in the interests of the Association, they had been cordially received, finding the officials interested in the work, and expressing a willingness to do their utmost to build up the dental sections. A highly creditable amount of work in accumulating specimens has been accomplished, while the library contains the best and most complete collection of dental literature in the world. But few men in the profession appreciate this great work in elevating dentistry in the estimation of scientific men.

The recommendation of Surgeon-General George M. Sternberg, endorsed by the Secretary of War, for the employment of a dental pathologist, passed the Senate, but failed in committee of con-

ference. The recommendation will, however, be renewed and submitted to Congress at its next session.

The committee appointed to take into consideration the establishment of a journal devoted to the interests of the Association reported that they had given the matter consideration, and believed that, if properly carried out, it would be of great value, both to the profession in general and to the Association, as a vehicle through which papers and proceedings of the various State and branch associations would reach the members of the dental profession throughout the civilized world. The income from subscriptions and advertisements would probably not be sufficient to meet expenses for the first few years, and the deficiency would devolve upon the Association. The committee, however, has in view a scheme by which they think the work can be established and carried out, but this is not yet wrought out in all its details. The committee, therefore, asked to be continued another year, which was granted.

(To be continued.)

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held at Young's Hotel, Wednesday evening, February 2, 1898, at six o'clock.

A paper was read by Henry H. Burchard, M.D., D.D.S.

(For Dr. Burchard's paper, see page 697.)

DISCUSSION.

Dr. Brackett.—With such names on the programme as those of Drs. Jack, Kirk, Stellwagen, and Eames, I thought that any part which I might be called on to take in the discussion of this paper would be small, and would come after the others; but with the circumstances as they are, I consider it a privilege to begin the discussion, to state my appreciation of the paper itself, and to express my gratification that the conclusions, in most particulars, at which the writer arrives are quite in accord with what my own experience has been. I will quote two or three illustrative cases.

It is a fact that there come under the observation of the practitioner of dentistry, not very rarely, cases requiring great care and skill in diagnosis, and a capacity to practically apply such

teachings as are impressed in this paper. There came to me about eleven o'clock in the forenoon of a day more than twenty years ago a gentleman of superior mental ability. He had been under the care of his medical adviser for two weeks for the treatment of neuralgia, located directly in the occiput. He had suffered extremely, and had been confined to his room for a considerable portion of the time, utterly incapacitated for giving attention to the practical affairs of life.

His medical adviser had suggested, everything else having failed to relieve him, that he came to me to have his teeth examined. On the right side of the lower jaw I found in the third molar an immense corono-buccal cavity, containing within a very broadly exposed, congested, and greatly irritated pulp. I said that I believed that was the occasion of his suffering. This seemed to him preposterous, but, when I explained how the nerves of the face and head could be affected by an irritated pulp, he said he would think about it. He went home and thought about it, and about two o'clock the next morning he came back. Gas was administered and the tooth was removed. When he had recovered from the effect of the anæsthetic his neuralgia was gone and there has been no return. That case is typical of numerous ones. Indeed, we usually find that patients coming into our offices with the statement that they have been having neuralgia have really been suffering from toothache.

Another case which I will mention was one in which there has been for years extreme general hypersensitiveness of the teeth. Owing pretty certainly to a lack of good capacity for digestion, there is a rather prevalent acidity in the oral cavity, with a tendency of the teeth to decay all about the necks, an extreme sensitiveness to touch of an instrument, and an incapacity to eat acid fruits. Considerable suffering has been manifested in numerous instances after the insertion of a metallic filling of any sort.

Two or three years ago I filled with amalgam an extremely sensitive cervical cavity in a right lower second molar. There had been suffering previous to the operation, but no exposure of the pulp. After the operation, in addition to the hypersensitiveness of the dentine, there was what appeared to be earache, starting in the ear itself. It was so severe that at the end of twenty-four hours I said that the patient should come to Boston and try to secure the best advice that could be had with reference to the ear. She came and saw first Dr. Clapp, and was by him introduced to Dr. Blake, who made a most careful examination of the ear, and could

make no other report than that he found everything normal. This satisfied me that the extreme sensitiveness of the dentine was the sum total of the cause of the suffering, which gradually lessened and disappeared entirely within a week or two.

There is a saying, worthy of being heeded, that "the man who is his own lawyer has a fool for a client." Sometimes a dentist, notwithstanding scores and hundreds of experiences to the contrary, thinks, if he is the patient, the patient knows which tooth is aching.

A few years ago I had, as I supposed, pain in a left upper molar. I hastily rushed to a brother dentist, and, without giving him the opportunity to make an examination, I asked him to make an application to the left upper molar, which relieved me for a time; but in a few days the pain came again, and I had another application made; and that continued for about six weeks, when my good friend suggested that he make an examination of the other teeth in my mouth. On doing so he found an exposed pulp in the left lower second molar, which had been the real seat of the trouble. I had not capacity enough to make out in that length of time where the pain was located.

It should not be forgotten, in our examination and in our dealing with cases as they come to us for the relief of pain, that the patient's statements, while they should be listened to and accepted as helpful, are not usually to be looked upon as of so much value as the results of our own investigation. In the matter of extraction, patients often come to our chairs with the statement that a particular tooth is the seat of pain. If we extract that tooth without demonstrating to our own satisfaction that it is the cause of the trouble, a very material percentage of cases of mistake will occur. It has sometimes seemed to me that twenty-five per cent. of error would be made through operating with the patient's testimony alone as the guide. These chances for error come through two or more channels. One of these is the well-recognized tendency of a nerve, under certain circumstances, to refer to the peripheral distribution the consequences of an irritation which is applied anywhere along the course of the nerve. The result of this is that an irritation which is taking place in a third molar seems to the patient to be located perhaps in the cuspid. We shall find numerous illustrations of this tendency if we look for them, so that I have made it a custom not to extract a tooth near the front of the mouth until I have satisfied myself about the conditions farther back. As a rule, unless a tooth shows unmistakable

signs that it is the source of the patient's trouble, such as the presence of pericementitis, or alveolar abscess, or a glaringly exposed pulp, I look also on the opposite jaw, being influenced by such conditions as I have suggested, and because there are many cases in which the occlusion of even a single tooth is of very great consequence. Another reason why we should not depend entirely upon the words of the people who come to us to be relieved of pain is that their statements are not always ingenuous.

It was my privilege several years ago to have referred to me for dental treatment a good many patients of one of the most eminent practitioners of gynecology of New England, now for some years out of practice. It was one of the cardinal principles of this specialist's practice to insist on the mouth being put in order, if the patient's condition would permit it, previous to his treatment of the pelvic organs or coincidently with that treatment. He recognized the possibility of harmful effects to the pelvic organs through the reflex action of any irritation which might affect the delicate nerve-filaments that are within the dentist's province.

If we were to allow, for an instant only, discussion of the converse of this paper,—of how disturbances in other regions may react most unfavorably upon the teeth,—I should have emphatic testimony to present. There comes to my mind another maxim of the specialist to whom I have just alluded,—that all surgical operations are most advantageously performed after the conclusion of the menstrual period. Not only operations within the gynecologist's special surgery, but operations in general surgery as well, are most hopefully and helpfully accomplished during what Dr. Storer designated the menstrual ebb. A case to which I wish to refer was that of a patient who came to me with trouble with the upper jaw. She was in a low systemic condition and very nervous. Examination showed a cavity in a left upper third molar. It was the only tooth in that region having a cavity, and the cavity was very small, almost literally a pinhead cavity. It was extremely sensitive, so much so that the drying of the cavity with bibulous paper caused greater shrinking than is usual if an instrument is put into the pulp-tissue. Although I had been conversant with the increased sensitiveness of the female nervous system at certain times, this impressed me as the most extreme instance I had ever known. She made it plain to me that she was then "unwell." I told her that if we could devise some palliative treatment for the time, after a while we could get on better with the excavation and filling of the cavity. There was put into the cavity deliquesced carbolic

acid, and no further attempt was made to excavate until after menstruation had ceased. She was then feeling very much better systemically, and the preparation of the cavity was practically painless. I attribute the great change partly to the effect of the deliquesced carbolic acid, but more to the different systemic conditions of the patient.

In one of the opening sentences of the paper there is a reference to epilepsy, and the suggestion of the possibility of the disease being aggravated by the presence of an abnormal condition of the teeth. Very shortly after my graduation, I was consulted by a young man, perhaps twenty years of age, who was subject to epilepsy, and I was asked if I thought the teeth had anything to do with it. The right upper cuspid had never appeared. I was able, by diligent search, to locate it, deeply embedded at an angle of about forty-five degrees from the position it should have occupied, and with no room in the oral cavity for its eruption. In that case I had no opportunity to operate, but I believe that the impacted tooth was at least an aggravation of the trouble from which he suffered.

One of the points in the paper which specially interested me was in regard to the employment of different degrees of temperature in the diagnosis of obscure cases. Heat is of very great value as a test for diseased pulp tending to die in a confined space,—that is, in a chamber that is not perforated by open caries. In a case of sharp pain with intermissions the application of heat, causing marked increase of pain, may be the means of locating the seat of the trouble and indicating the treatment to be pursued.

A very satisfactory means of applying the heat-test is by using mineral talc, or French chalk, similar to that which the tailor uses for marking cloth. A piece of the material is easily cut into a convenient shape for carrying in a port-polisher so as to reach any tooth. It readily absorbs the heat of an alcohol lamp, may be heated hundreds of times, and does not corrode.

I agree cordially with the expression in the paper that calcifications within the pulp are not frequent causes of disturbances. I remember that our worthy president, some years ago, gave us a very interesting illustrative paper with reference to the very great frequency of these calcifications in the pulp-chamber. I believe that in some thousands of extracted teeth which he opened he found these calcifications present in about twenty per cent. The teeth were a miscellaneous collection, extracted for all reasons, and the showing appears to be that calcifications in pulp-tissue are much more frequent than is trouble from them.

In this connection a most important matter has not had mention,—that is, that in quite a percentage of true neuralgic affections the circumstance of nutrition is one of great consequence. I have seen a half-dozen cases, perhaps, of obscure, intractable neuralgia in elderly people in limited circumstances, poorly nourished, insufficiently clothed, not well housed, living in an unfavorable environment, perhaps overworked, in which I believed the affection was purely a systemic one. And we have heard of some cases under similar circumstances in which tooth after tooth has been extracted, until the patient has become edentulous, and the neuralgia has continued just the same. Of course there are opportunities for other nerve lesions outside of the province of the dentist. This fact should be recognized, and we ought not rashly to sacrifice teeth on the slight chance that relief may be afforded. In my own case overwork carried too far, and without proper sleep and taking of food, develops slight neuralgia of the scalp. I never have neuralgia under other circumstances. I have also the testimony of a physician who was at one time an extreme sufferer from neuralgia, sometimes affecting the side of the face, and again the supraorbital region; and being unable to locate the cause, or to find it through an examination of the teeth or eyes by competent specialists, after a very careful, searching investigation of his whole physical condition he came to attribute it to a lack of good functioning in the stomach, and he has found that by a very careful attention to his diet, eating regularly, and keeping himself in a well-nourished condition, his neuralgia is very much better.

This is a very prolific study, and one which we should all pursue for ourselves, in order that our patients may have the benefit of the most skilled treatment which it is in the power of the dentist to give.

Dr. Eames.—I hesitate a good deal about saying anything, especially as the essayist has covered the ground carefully, and Professor Brackett has given detailed cases, illustrating quite fully the principles upon which reflex disturbances depend. I recall some cases of reflex disturbance, but they offer no different principles from those which have been illustrated both in this paper and in cases already mentioned.

I have one case under care and study at the present time, that I might well mention and report upon in the future, if it ever becomes possible for me to ascertain the disturbing factor in the case. It is the case of a girl sixteen years old, whose teeth have been under my care from infancy, and in whose teeth there are no deep

cavities, for the slightest appearance of decay has been checked. I can find no lesion whatever about the mouth. The girl is extremely robust and healthful in appearance, very large and strong, and she takes part in all the vigorous exercises and games of the girls of her age. It is my belief that the predisposing cause of the neuralgic pain from which she suffers is due mainly to this condition of plethora just described; besides, she is at that period of development and growth in which there is unusual activity and excitability. If there is hypertrophy of the cementum, or if there is, at that early age, a developing wisdom-tooth which is giving pressure, or if there is any calcific formation in the pulp, I cannot find any evidence which will enable me to ascertain if that be the fact. I do know that she has gouty ancestry, or that in many of her relatives pulp-nodules have been found.

In discussing this subject we are reminded that there are cases of reflex disturbance in which there is a distinct dental lesion which can be found and the cause removed; there are also cases in which the cause cannot be found by any ordinarily careful examination, and in some of the cases the Röntgen ray is of great service,—for instance, in such cases as hypertrophy of the cementum, impacted teeth, unerupted teeth, etc.,—and the paper does well in calling attention to this means of diagnosis. Cases in which there is no dental lesion to be found, and in which the pain is probably quite remote from the irritation, indicate some constitutional disturbance, and therefore the only hope of relief lies in constitutional treatment.

Many cases have been cited here to-night of the existence of pulp-nodules with no symptoms whatever, and I have found such. I have also found many cases, especially those in which there was a gouty diathesis, in which the pulp-nodule has seemed to give rise to extreme neuralgic pain. It has been stated in the paper that neuralgic pain may be due to pulp-nodules or other calcifications pressing upon nerve-fibres in the pulp. I do not see how any calcification within the pulp-tissue can occur without pressure upon the nerve-fibres. Therefore, as we have reason to believe that there are many cases in which no response is made to the pressure of the pulp nodule, I conclude that in the cases in which it does give intense pain it is due to the general condition. The nervous system is in such an irritable condition that the mere presence of the nodule produces intense pain. In such cases our only hope for relief is in constitutional treatment; the patient must be put into a condition similar to that of those who have pulp-nodules without pain.

Dr. Jewell.—I would like to say just a word in regard to a case I had. The patient, a lady about sixty years of age, was sent to me some time ago by a physician. She had been having a great deal of neuralgic pain in her lower jaw. After a thorough examination I told her I could not find anything that would cause the trouble; that her teeth were all perfectly sound. She said she thought the cause might be the second molar, which had a small gold filling, but it appeared to be all right. In a few days she came back to me and insisted that the pain was in that second molar tooth, so I removed the gold filling and replaced it with gutta-percha.

The pulp was not exposed; in fact, the cavity was not very near the pulp. That change afforded her a little relief, but not complete relief, and I then removed the gutta-percha and cut down near the pulp, and found it extremely sensitive. I then made an application to destroy the pulp, which was not very successful. When she came in again I opened into the pulp-chamber and found a very large pulp-stone almost filling the entire chamber. Of course, the pulp was extremely sensitive, and I tried to allay the irritation by opening into it freely, so as to make certain of destroying it, and even then did not succeed in removing the sensation. Finally, as a last resort, I removed the tooth, and she got some little relief, but still the neuralgic trouble continued in a very severe form; in fact, she has it constantly. The query in my mind now is, how far I should be justified in opening into or extracting the remaining teeth.

She is an intense sufferer from neuralgia, and there is no doubt in my mind but that it proceeds from her apparently sound teeth. I think they are all or a part of them in the same condition.

Dr. Eames.—I would like to ask Dr. Jewell if in this case he was able to drill down into the roots to any extent?

Dr. Jewell.—Not fully. They were nearly closed up.

Dr. Eames.—I would simply suggest that sometimes these deposits extend quite a distance into the root-canal. In some cases, when seemingly the path is entirely calcified, if we penetrate farther into the canal we shall come in contact with living pulp-tissue. It may be it is the irritation of this nerve-tissue which is left which is the cause of the trouble.

Dr. Jewell.—In this case the roots were almost completely closed up. What I would like to know is how to treat such a case. Would I be justified in drilling into the other sound teeth, or in extracting them? The patient is still a great sufferer, and I have

no doubt of the cause. The pain is confined to the right side of the lower jaw. The upper teeth are in good condition, very hard and dense in character.

Dr. G. T. Baker.—The case is almost identical with one I had in my practice, only the relief was permanent after the pulp-chamber was opened and filled.

Dr. Eames.—While in many cases of severe neuralgia the cause may be traced to calcified formations in the pulp, which being removed effect a cure, yet in one case I found such a formation which had never given pain. In the case to which I refer I was obliged to remove a tooth for the purpose of regulating, and after doing so I broke it open and found a large pulp-nodule. I have no theory to offer regarding its presence there, except to mention that there were some appearances of gouty diathesis in the teeth. There had been no caries in the tooth, and no disease of the pericementum.

Dr. Smith.—A most marked case of reflex neuralgia resulting from calcification of the pulp occurred in my practice a few years ago. The patient was a man who was suffering with excruciating pain from the shoulder down through the forearm. His physician had kept him under the influence of morphine for a week before the case came to me, and they felt that the trouble was caused by an erupting wisdom-tooth. The gum had been lanced thoroughly and well, without any relief to the poor sufferer. Finally he was sent to my office one Sunday morning. The wisdom-tooth was not erupted, but there seemed to be plenty of room for it to erupt. The second molar was unfilled. The first molar had a small mesial cavity filled with cement. I diagnosed this case by eliminating from the diagnosis all other possible causes. The upper teeth were examined thoroughly, tested in every way, and I came to the conclusion that it might be a pulp-stone in this first molar. I explained to him what I thought, and that I proposed taking out the cement filling and making an investigation, giving him to understand that it might not be the cause of the trouble. I took out this cement filling, having to work very carefully on account of the extreme sensitiveness. The cavity did not extend near the pulp, but I continued to drill carefully until I made an exposure and found that a cornua of the pulp had calcified and detached itself, so that it acted like a shot put into the pulp-chamber. I removed the pulp-stone and dressed the cavity, and in two hours after he left my office he was free from all trouble in his shoulders and arm. I have had similar cases, but none where the relief was so prompt.

I am inclined to differ from those who think calcification of the pulp is not a frequent cause of neuralgia. Dr. Brackett has referred to the specimens examined by Dr. Cooke, stating that in the examination of a great number of extracted teeth, taken as they came, a large percentage of calcification of the pulp was found. Yet it seemed to me that while this investigation proved to us that the presence of calcific matter in the pulp was more common than we thought, it does not prove that patients who had those teeth had not suffered from neuralgia. I believe Dr. Cooke does not know the history of the teeth which he examined; they may have been the cause of treatment by physicians for some obscure trouble, and this trouble the physician may or may not have been successful in relieving. I feel, as I said before, that calcification of the pulp plays no small part in cases of neuralgia, the cause of which cannot be found, especially so where we have a cornua of the pulp calcified and detached, producing the effect of a foreign body in the pulp.

Dr. Werner.—We are not physicians enough to treat all cases of neuralgic condition. The perversions of the general functions of the body are, to my mind, many times the cause of neuralgia, and how we specialists can think our treatment intelligent or efficient by simply removing teeth I do not see. When an individual suffers from a thorough perversion of his systemic functions, with a decided uric acid diathesis, with an impairment of the whole eliminative system, composed of five or six miles of ducts, is it any wonder that a neuralgic condition exists, and how can such a condition be treated locally? Why not resort first to the treatment of the perverted constitutional condition? I can have neuralgia if I work too continuously at my chair, if I eat meat three times a day and take no exercise, and can localize it more or less in a first molar. When I exercise, when I get plenty of out-door work, I do not have neuralgia; and when I do not find myself able to take the necessary out-door exercise I resort to the lazy man's way of correcting systemic conditions,—take a Turkish bath, and with the improvement of the general tone my neuralgia vanishes. It would be folly for me to think that I ought to have my first molar out, or that I should suspect a troublesome calcification taking place in the pulp. No doubt calcification is going on, but unless it becomes very marked or I become much debilitated, I will not notice it. I have long since ceased to think that by simple dental interference you can correct many of those obscure cases of neuralgia.

Dr. Andrews.—I wish to add a word to one phase of this discussion. In the course of his remarks, Professor Smith referred to the

large percentage of pulp-stone found in apparently healthy mouths. I do not see how there can be an abnormal calcification of the pulp in the mouth of a very healthy person. There must be some pathological condition present to produce this result. A cause of much obscure trouble is often overlooked in our endeavors to diagnose the case. I refer to malocclusion, and the clinching of teeth during sleep, and the consequent irritation. In such cases there is apt to be over-stimulation of some active cell-tissues, producing a growth of bone, exostosis or hyperostosis of the root, or an irritation from the side of the pulp-cavity, in which case calcific excretions or growths form and grow into the pulp-tissue. I cannot see how this can be considered other than a pathological condition, brought about by irritation of active cell-tissue whose deposits are increased by the constant irritation. I have had some curious cases in my own practice which I have succeeded in tracing to the grinding or clinching of teeth in sleep. There will be one or two teeth which will impinge upon some tooth in the opposite arch, causing an irritation of periosteal tissue. This is shown pretty conclusively by patients saying that when they wake up in the morning the tooth is sore and has a sort of dull ache, which disappears later. During this time the patient may also have neuralgic pains at some remote point. Generally, I have found that grinding the occluding tooth so that it cannot be touched by articulation has proved very beneficial. In one case I tried for quite a long time to treat a neuralgic trouble about the head and face. I asked the patient, after some considerable treatment, if he was in the habit of grinding his teeth. He said that he was not; but on another visit told me he found that when he was nervous he was in the habit of grinding on an upper cuspid, clinching it rather hard, and he had forgotten to tell me about it. On grinding the lower teeth a trifle, so that he could not articulate with the upper one, the recovery was almost immediate. I think the number of cases of obscure pain which might be traced to the grinding of the teeth during sleep is a great deal larger than we have any idea of.

Dr. Brackett.—It would be unjustifiable presumption in me to say concerning histology anything not in accord with our friend at that end of the table, yet it is my understanding that the calcification of a pulp is not an entirely unnatural process; that there is a steady deposit going on,—not markedly, as in some of the instances which Dr. Cooke reported in his investigations, but that calcification does go on until in elderly people, in some cases, the pulp is entirely obliterated. I have had several cases myself where a great

amount of suffering was undeniably caused by calcifications in the pulp. One case was that of a lady who was in bed for two weeks, and was treated by a prominent New York physician for a severe neuralgia, and referred to me for examination of the teeth. I diagnosed pulp-stone in a molar, and was obliged to make several applications for the destruction of the pulp. After I got out quite a group of calcified nodules, relief came. I have had a few instances of obscure pain in sound teeth which, I have found out in a slow, blundering way, were occasioned by the dying of the pulp, without any explanation that I could find other than in one instance there was present a rachitic condition. The patient was a dwarf, and presented many physical defects. In that case I treated successfully four dying pulps in perfectly sound molar teeth. The history is much like that of a tooth that has been filled with metal close to the pulp. In my first case of this kind I was a long time in finding out that the trouble was caused by a morbid pulp. Another case was that of a lady in whose mouth I found a dying or dead pulp in each of four or five molars, and in every instance the teeth were sound or had been so previous to the dying of the pulp.

With reference to the matter of which Dr. Eames was speaking, a great many years ago there was brought to Dr. Riggs, of Hartford, a patient telling some such story as the young lady mentioned by Dr. Eames. This young lady was perhaps nineteen years of age. Her teeth were hard and strong, of excellent quality, and no cavities could be discovered on examination; but the patient was suffering a severe neuralgia, extending from shoulder to shoulder. Other dentists had made careful examinations without being able to discover any cause for the trouble, and the case was pronounced to be one of intractable neuralgia. Dr. Riggs said, on inspection of the case, that the trouble was undoubtedly caused by hypertrophy of the cementum. It seemed as if he knew by intuition. Anyway, his opinion was regarded of such value that his advice to remove from a fairly regular arch four perfectly sound bicuspid was followed. His diagnosis proved correct, for it was found that on the roots of the bicuspid exostosis of the cementum had taken place, and his theory that the relief of the crowding would be followed by a cessation of the suffering also proved to be the fact.

Dr. Andrews.—I was not referring to normal calcification of a pulp-cavity from the odontoblastic layer, which takes place evenly all over the cavity as age goes on, until in some cases two-thirds or

nearly the whole cavity has become calcified. This is entirely different from the calcification which produces excretions which might be compared to a papilla of bone growing into the pulp-substance. I have several cases in my own collection of specimens where there are growths like papilla coming from the side of the pulp-cavity, and in some of the cases this abnormal calcification has grown to the extent of almost closing up the pulp-cavity. This calcific growth goes on independent of the odontoblasts, and is at the expense of the connective-tissue cells of the pulp-tissue, and is the result of some pathological condition, and not the normal growth from the whole odontoblastic layer, which, as I have said, may go on to the extent of almost closing up the pulp-cavity and yet be a perfectly normal and healthy condition.

President Cooke.—In regard to the percentages of teeth which I found containing pulp-stones: as I remember it, I cracked up about five thousand teeth, and out of that number I found over a thousand containing pulp-stones, varying in size. The largest percentage was found in the molars, which, I think, contained something like thirty per cent. The cuspids came next, with a little more than ten per cent., and the bicuspid and incisors were about the same, showing but a small percentage in each. I do not think that every time you have a pulp-stone you have neuralgia. It is my belief that, if I cracked up every extracted tooth I could find, I would get about the same percentages of pulp-stones that I found in those which I did examine. It has been suggested that we do not know the history of them. That is very true, and many of them may have caused trouble which the physician or dentist could not account for. I think it would be interesting if we could get statistics showing the number of cases in which we have treated neuralgia by the removal of the deposit called pulp-stone. I think they would be comparatively few, and yet I think the number of pulp-stones in the mouths of our patients is very great. In speaking with a specialist on nervous diseases with regard to this subject, he said it would be possible for the pulp-stones to be present, and while the tone of the body was up a person would feel no inconvenience from them, but if the nervous system should in any way become run down, then you would be likely to get twinges from the teeth. They might be the point most easily irritated. That is his theory.

When I was making investigation, I became so familiar with the peculiarities of teeth that in looking them over I would say to myself, "There is a pulp-stone in that tooth," and I would find one in almost every instance. In some cases they would be small, like

shot, and in other cases would almost entirely fill the pulp-cavity. I remember one lower third molar which I cracked open and found the pulp entirely calcified, but was movable in the cavity. In cases of decayed teeth, it has seemed to me that the calcific matter has been thrown in not so much to protect the pulp from decay, but has probably been caused by the irritation of the decay. I sent about three hundred specimens of the different kinds down to the Harvard Dental School, where any one who is interested may examine them.

Most of the teeth that we are called upon to treat are imperfect in some way, and, taking into consideration the conclusion which I reached in my investigation,—that the percentage of pulp-stones is about the same in all teeth,—in the treatment of any obscure trouble in which the teeth are suspected, I should recommend trying everything possible in the way of local and systemic treatment, and finally treating for pulp-stone.

WILLIAM H. POTTER, D.M.D.,
Editor American Academy of Dental Science.

ACADEMY OF STOMATOLOGY.

THE regular monthly meeting of the Academy of Stomatology was held at the rooms of the Academy on the evening of June 28, 1898, the President, Dr. M. H. Cryer, in the chair.

After the transaction of routine business, "Incidents of Practice" with discussions were presented by the Fellows of the Academy.

INCIDENTS OF PRACTICE.

The President.—As there is no special paper for this evening, "Incidents of Practice" will be in order. If any one has any interesting subject of office practice to present, we will now listen to him.

Dr. Huey.—While some one is making up his mind to tell us something of interest, I would like to ask if any one knows of a paper tooth that has been invented and placed on the market. I saw an account of it in a local paper a few days ago. The article said that for durability it excelled the porcelain tooth; that it was easy of adjustment, and made a very natural substitute. I do not know anything about it.

Dr. William Trueman.—I saw a statement concerning it in one

of the journals quite recently, and thought it was a canard ; I did not think it was a practical thing. In connection with this, I remember seeing in a dry-goods store on Eighth Street some years ago full sets of teeth, upper and lower, made of paper pulp.

The President.—As this subject has not interested the Academy very much, we will pass it. I should like to hear from some other members. Gentlemen, we are here to talk. You assemble, two or three together, and talk about the little things that happen in your offices, and we would like to have these cases reported and discussed for the benefit of all.

Dr. Huey.—We are all more or less interested in the "moss-fibre" gold recently introduced by the S. S. White Dental Manufacturing Company. I have used something like half an ounce of it, and while I have not yet gained sufficient courage to attempt a restoration, I have found it to work admirably in difficult, inaccessible cavities, especially in repairing gold fillings where recurrence of decay has taken place. I find that I can pack that gold against old fillings very much better than any other form of gold I have tried. I do not know that it will take the place of foil, but I am experimenting with it, and am satisfied with the result of the experiment. With the use of very fine points I find it makes a fairly condensed filling and burnishes down well to the edges of the cavity. I have noticed that it absorbs moisture more rapidly than any other gold, consequently it should be reannealed after any lapse of time or for any subsequent fillings.

Dr. Roberts.—I have been using moss-fibre gold quite extensively lately, and it works very nicely. It does not crumble readily. Of course, all fibrous gold and sponge gold will crumble, but there is less waste with moss-fibre gold than with any I have used. I have not used it in contouring incisors, but in molars and bicuspidis I have had satisfaction with it. It is soft, and the only fear that I have about its use is that it will work too easily. By using too much of it in a mass one may not get the gold thoroughly condensed, but by using not too large points it works as nicely as any gold. It is very cohesive, and can be used in almost any place, either with special instruments or without. It is easier to work with the special instruments on account of the shape of the instrument alone. Nearly all the instruments are of a ball shape and serrated, not only on the end but on the round sides, with view to the rotation of the instrument in the act of condensing. I have used it with the ordinary corkscrew hand-instruments, with the automatic and engine mallet, and it packs beautifully.

Dr. Gardiner has been using it largely with the electric mallet, and he will tell us his impression of its action under that instrument. It is well to have as large an instrument as will conveniently enter the undercut of cavities, and carry the gold solidly into them. I anneal, then tear off a small portion with pliers and place it in the cavity. I pack almost entirely by hand-pressure, but in contouring I finish up with the automatic or engine mallet.

Dr. Huey.—After various experiments, I have found that in annealing over a flame I was apt to burn the edges of small pieces, so I went back to my mica sheath, and I have more satisfaction and less waste. I can get any heat I desire in that way, but usually anneal to a red color.

I find that I can keep my filling very much smoother and prevent pits by first condensing by hand-pressure and then consolidating with the electric mallet.

Dr. Gardiner.—I have been using moss-fibre gold with increasing satisfaction for some time, and I like it very much. I first anneal a large piece on mica, and from this tear small portions with pliers to be used without further annealing. In starting a large filling it is much easier to first bridge across the cavity by hand-pressure. After that it can be either worked down by hand-pressure or introduced and worked with the mallet. I work it more rapidly with the electric mallet. In large cavities it promises to be a great time-saver. The danger will lie in the temptation to work it too rapidly, and in that way produce defective work. It should be worked as carefully as any other gold, though it packs much more readily, and in larger pieces. It will be of more use in large cavities than in small ones because of its bulky nature. With a little practice one can use almost any point with it, but I think that shallow serrations are much better. Of course, in beginning a filling the larger points are better, as they prevent rocking. The bottom of the cavity should be as flat as possible, as a convenience in starting. In all cavities that are not very deep the plane of the cavity can easily be made flat without destroying too much tooth-substance. I have not tried extensive contour work, for I have not worked sufficiently long with it, but I would not hesitate to fill contour cavities of molars and bicuspsids and large occlusal cavities.

Dr. James Trumun.—My microscopic examinations in this direction have led me to believe that it is extremely difficult to isolate a crystal of gold, but I have succeeded in repeated instances, and found it to be simply the usual form of crystal and not the aggregation we see. Some of the manufacturers of gold speak of the

crystals of gold as being "fan-shaped." It is a great error and ought to be corrected.

I have had no experience with this gold. For a number of years I avoided all sponge golds of any character, for the simple reason that I was never able to get my edges satisfactory, owing to the sliding of the crystal, which gives the edges a spongy character. I do not think we take sufficiently into consideration the action of the crystals of any of the metals we use. In so-called rolled gold any variation in rolling will destroy the crystalline character, and we will not get cohesion. The same thing occurs with tin. I early abandoned rolled gold because of this defect in preparation.

Dr. Gardiner.—In speaking of crystals being larger, I did not mean to speak accurately. I should have said, "an apparent increase in the size of crystals;" but probably *coarseness of fibres* would be more correct. So far I have had no difficulty in obtaining good margins with this gold in the cavities in which I have used it, and I think that the gold, when it is thoroughly worked and condensed, is fully as hard as any other that I have used. It has the appearance of being hard, at least.

Dr. Huey.—Some of us will remember a form of sponge gold put on the market about twenty years ago, that brought distress to a good many, myself among others. I had to replace all operations I made with that gold, and I then vowed that I would never touch a sponge gold again. I was induced, however, to experiment with this new form of gold, but hesitated to risk it in places where there would be much leverage, fearful that it would break away. *Dr. Truman's* note of warning is very wise.

Dr. Roberts.—While we are on the gold subject, I would like to get the experience of some one who has used rolled platinized gold extensively as to the result after having it in the mouth for a length of time. There are some qualities about the filling, after it is finished, which are very pleasing, particularly in the front teeth, where the filling shows. It is much harder and is very frequently so nearly the color of the tooth that it is unnoticeable; but whether it will retain the same beautiful effect after it has been in the mouth for a number of years I do not know.

Dr. Peters.—I have not used this gold very much, but have tried it a few times, using shades Nos. 2 and 3, but did not get any of the results that *Dr. Roberts* speaks of. I think it is as noticeable as any other gold. It is certainly much harder. In any other way I do not see any improvement.

Dr. Gardiner.—I have been using rolled platinized gold ex-

tensively for the last few months, and I am very much pleased with the results, particularly in locations exposed to view. It is preferable to the pure gold in appearance, and its superior hardness fits it for extending the cutting edges of teeth. I have been doing some quite extensive operations; placing it beside some pure gold operations, and I think any one would agree that the platinized gold ones are far preferable in appearance. I do not fill the anchorages with it because it is stiffer; though it could be used in that way. I fill the anchorages with pure gold, because it is done more readily, and then add the rolled platinized gold to it. The gold should be annealed in the flame to a white heat to bring out both softness and cohesiveness. All that is necessary is to bring the surfaces into contact. It does not take more than ordinary force to weld it. The first work I ever saw done with it was a restoration of the cusp of an upper molar brought into hard wear. The edges were perfect, it was not pitted, and, in fact, it was an ideal operation in every way.

Dr. Fellows.—Some years ago I had a patient come to me to have a few teeth extracted; she had been wearing a plate for perhaps fifteen years. There were but one or two teeth to be removed, and afterwards I placed a plate in her mouth. In the course of a year or so I heard through one member of the family that she had been having a good deal of soreness about the mouth. When removing the teeth I noticed that there was an elevation in the palate running from the alveolar process towards the centre of the vault, and I took it to be an irregularity or malformation. When, a year later, I examined it I found that she had an impacted cuspid. It was impossible to get it out by ordinary means, but after a little cutting I was able to remove it entirely, and found that the enamel which was rubbed by the plate was very much resorbed and pitted. It seemed as though nature had attempted to remove the part causing irritation. I had an idea that it had not been resorbed until the plate was put in the mouth. I have the specimen in my pocket, if any one cares to look at it.

A second case is that of a patient who had trouble with a bicuspid tooth. The root was so badly affected with calculus that I thought it was best to extract it. I made an examination, and I found it was filled with gold almost to the end of the root. There evidently had been a good deal of irritation, and, in consequence, nature had attempted to resorb the root, the end of which was much pitted. The specimen is interesting in that evidently the operator had worked very carefully to fill the root with gold

and had made a failure. I have never seen a root filled with gold that was filled perfectly, and I have seen a good many. This had been filled a good many years.

I had another case, some ten years or more ago, of a physician who had a tooth treated while attending college. A dental student put in a pellet of cotton with arsenic on it, and covered it over with gutta-percha. The gentleman did not return to the student, but was in practice some fifteen years when he came to my office, and when I opened into that tooth I found the pulp dead and the cotton intact, nor was there any harm caused by the arsenic he had placed there. I could not find any special odor. I merely bring these cases up for the purpose of showing how long cotton fibres will remain intact and how imperfect a gold root-filling is apt to be.

Dr. Cryer.—With reference to these canine teeth, the enamel is either decayed or resorbed. The imperfection may have taken place during the formation of that tooth, it not having originally the power to get into its position. I have extracted many of like character, where there have not been plates inserted in the mouth. In a specimen that was illustrated in the *Dental Cosmos*, there were thirteen teeth surrounding an impacted central incisor. In that case the central incisor was defective in the way in which this canine tooth is. I think it is more than likely that the artificial plate had nothing to do with causing the defect. It might cause the absorption of bone and gum-tissue and expose the root or tooth in that way, but I do not think it would affect the enamel.

Adjourned.

OTTO E. INGLIS,
Editor Academy of Stomatology.

Editorial.

REPORT OF COMMITTEE ON FOREIGN DEGREES.

AN abstract of the report of this committee, presented to the National Association of Dental Faculties at Omaha, is given upon another page of this number, and a careful reading of it is urged upon all who feel an interest in the reputation of the dental profession in the United States. Its preparation does credit to the

chairman, Dr. Barrett, for it is the clearest presentation ever given upon this important subject. The constant charges made abroad against the dental educational institutions of this country find here a complete, and, it is hoped, a final answer.

The report as given is described as an abstract. It is this only in the sense of having some personal matters cut out. In other respects it is as presented to the Association of Dental Faculties. It would have been more satisfactory to the writer to have given it in full, but, for reasons not necessary to enlarge upon, it was deemed better to omit, for the present, certain portions which require further legal proof.

It is undoubtedly true that the immoral side of life would never be presented if it were not preceded by an immoral demand; and this is axiomatic, whether confined to individuals, communities, or professions. The sale of fraudulent diplomas has been a source of continued trouble for many decades. The demand for these, as the author of the report truly states, has never come from this side of the water; in fact, a diploma of this character would be utterly valueless here, for, under existing State laws, it could never be admitted to registration, and, without this, practice under it would be an impossibility. The demand comes from various quarters of civilization, or these fraudulent manufactories could not exist. It has been evident to dental educators in this country that, for some unexplainable reason, there is a desire to possess one of these diplomas, for the stream of applications requesting a diploma *in absentia* has been constant for many years. In recognized dental colleges these have invariably gone into the waste-basket. To those familiar with the laws governing practice in Europe this repeated demand is inexplicable. The desire, however, exists, and hence the reason for the nefarious traffic described in the report.

It was supposed that when the authorities succeeded in imprisoning the notorious Buchanan, and death ended his career, that all further attempts to issue these diplomas would have ceased, but the constant and ever-increasing demand found new sources of supply.

It has been difficult for foreign practitioners to understand why this traffic should continue undisturbed. The writer of the report makes this sufficiently clear, but it is doubtful whether the explanation will satisfy these critics. The European standards of legal restraint are quite different from those in force here, but it is questionable whether, with similar conditions prevailing there, these men could be convicted under any of the governments of continental

Europe. It is one thing to be morally convinced that a man is guilty of a crime and quite another thing to be able to prove it, and the proof, as the report states, is not to be had in this country.

Whether this can be secured abroad is doubtful. These diplomas probably never come under the examination of the police. They serve a purpose for office examination, and give a certain character to the practitioner with a class who fail, through ignorance of the subject, to be able to distinguish between the false and the true, and thus the man acquires a private reputation of having an American diploma and an American training.

It is very doubtful whether this traffic in degrees can be stopped unless our *confrères* abroad can devise some means to secure legal evidence. That every effort will be made by the committee of the Dental Faculties having the matter in charge is assured from the well-known character of the chairman. He should receive the earnest co-operation of all professional associations, as well as individuals.

In order that the work may proceed without delay, money will be necessary. The Association of Dental Faculties is pledged to do its part financially; but it should not be left for this body to raise all the funds required, for the entire dental profession has an equal interest in the suppression of this blot upon it and upon our country. The writer would suggest that the committee ask for contributions from all local and State organizations. This will require time, but time is demanded to secure evidence necessary to carry these men into court.

The appointment of advisory committees abroad by the Dental Faculties is a move in the right direction. Complaints are constantly being made that men are received in the senior year by colleges in this country upon certificates of no value. This must be exceedingly rare now, with the more exact knowledge prevailing of continental methods. The appointment of these local committees will, however, obviate all the difficulties connected with foreign languages and foreign institutions, for no applicant for matriculation from abroad can be received unless his certificate has the endorsement of this advisory committee. Until these committees are appointed and get into good working order there will necessarily be some confusion, and perhaps some injustice to individuals, hence ample notification should be given for a full knowledge of this salutary measure both in this and foreign countries.

The efforts of the Association of Dental Faculties have been given from its first organization to the purification of professional

teaching, and the labor of the present year has been simply a continuation of this good work. It can be depended upon to carry dental education to the extremest limit attainable, and to equally rid the country of all pretenders, whether they issue irregular diplomas or prey upon a too gullible public in other directions.

Bibliography.

ORTHODONTIA, OR MALPOSITION OF THE HUMAN TEETH: ITS PREVENTION AND REMEDY. By S. H. Guilford, A.M., D.D.S., Ph.D., Professor of Operative and Prosthetic Dentistry, and Dean of the Philadelphia Dental College, etc. Third edition, revised and enlarged. Press of T. C. Davis & Sons, Philadelphia.

That this is the third edition of this valuable text-book on orthodontia in nine years proves, beyond any words, that its value is thoroughly established. This edition has "largely been rewritten, its size increased by more than twenty pages, and some fifty new illustrations introduced. . . . Every chapter has been more or less changed to conform to present knowledge, and three new chapters introduced."

The new chapter on "Dynamics of Tooth Movement" will prove a satisfactory addition to students and many practitioners, for the importance of secure anchorage and the proper application of force are the main difficulties to be considered in all cases of regulating.

This work of Dr. Guilford has been reviewed in previous editions, and the opinions heretofore expressed remain in force with the present issue. Its convenient size, systematic treatment of this difficult subject, combined with clearness of description, make it one of the most reliable text-books issued. This was to be expected from the long experience of the author as teacher and practitioner; but, unfortunately, the ability to prepare a good text-book is not always coexistent with the faculty of manipulative skill. The author combines both qualities, and his work, therefore, appeals to all grades of intelligence in dentistry as a work for continued reference and for practical application.

ANATOMY AND HISTOLOGY OF THE MOUTH AND TEETH. By I. N. Broomell, D.D.S. P. Blakiston Son & Co., Philadelphia.

Dr. Broomell's new book will be issued in a few days. The writer has had the privilege of glancing over the advanced sheets, and he is confident he hazards nothing in making the prediction that this will be regarded as the most original book issued in recent years upon the subjects treated. A full review will be given in the December number.

Obituary.

DR. GARDNER QUINCY COLTON.

DR. GARDNER QUINCY COLTON, through whose instrumentality "nitrous oxide gas" was first used in dentistry, died August 9, 1898, in Rotterdam, Holland. He had been on a visit to Europe, and was about to return home, when he succumbed to a complication of diseases brought on by old age.

Dr. Colton was born in Georgia, Vt., February 7, 1814, and was the twelfth child of his parents. He first learned chair-making, and when twenty-one years old came to New York, where he followed his trade, studying all the time, however, in the hope of becoming a physician. In 1842 he entered the College of Physicians and Surgeons, and later studied in the office of the late Dr. Willard Parker.

Two years later he began to deliver lectures on physiology and chemical phenomena. He had acquired a knowledge of electricity, a science then in its infancy, and invented an electrical motor, which he exhibited, illustrating his lectures with it. This motor is now in the Smithsonian Institution in Washington.

Dr. Colton went to California in 1849, where he searched for gold and practised medicine among the miners. He was the first man in California to be appointed a justice of the peace. With a competence he returned to the East, and went about the country lecturing, telling his audiences of the anæsthetic properties of the laughing-gas. In 1863 he established an office in the Cooper Institute. A few years later he was able to visit Paris with a record of twenty thousand administrations. Returning to America, he opened offices in Philadelphia, Boston, Baltimore, and several other

cities, and thus through his energy and perseverance the use of nitrous oxide gas as an anæsthetic became established, and dentists throughout the length and breadth of the land began to use it.

In 1844, when lecturing in Hartford, Conn., and showing the effects of nitrous oxide gas on persons to whom he administered it on the stage, Dr. Horace Wells, who became one of his subjects, was impressed with the possibility of using the gas in dentistry. He told Dr. Colton of his idea, and the next day he had the gas administered to him and a tooth extracted.

Dr. Colton was also an author and a Shakespearian scholar. He published a brochure on "Shakespeare and the Bible," and wrote a good deal upon the discovery of anæsthesia.

C. S. McNEILLE, D.D.S.

DR. EMILE DE TREY.

DR. DE TREY died at Zurich, Switzerland, August 3, 1898. He was born at Vevay, Switzerland, in 1846. He began the study of dentistry, at twenty years of age, at the University of Berne, where he remained for one year. He came to the United States in 1867, and entered the Pennsylvania College of Dental Surgery, graduating from that institution, and returned to his native country, continuing his studies at the University of Berne, from which he received his diploma in 1869. He began practice in Vevay, and continued there for twenty-three years, and subsequently removed to Basel, where he remained in practice to the close of his life.

He was one of the founders of the American Dental Society of Europe, and also a member of the Swiss Odontological Society.

His introduction of the peculiar form of sponge gold, known throughout the dental profession as the "solila gold," made his name a household word wherever dentistry was taught and practised.

The writer knew him as a student of marked ability, and during all of his subsequent life has observed with increasing interest his earnestness and devotion to the good of his profession. His ability as a practitioner was of a high order, and throughout his professional life he maintained an elevated standard, his career continuing an honor to the school from which he received his degree. His comparatively early departure from the active duties of life is a personal as well as a professional loss.

The sympathy of those who appreciated his life and work on this continent is extended to his family in their severe bereavement, and to our *confrères* in Europe for the loss of a colleague worthy their honor and respect.

Dr. de Trey married Mlle. Leah Pittet, of Vevay. Six sons and two daughters survive him.

Notes and Comments.¹

DR. BLACK'S THEORY.—Dr. Black says that all teeth are equally soft; that the dentine of all teeth is the same in density; that they have the same specific gravity; that a good tooth is no better than a bad tooth; that any filling-material that will save one tooth will save any other, and that there is no choice except on the part of the dentist between lead or tin or gold or amalgam. Well, now, I do not believe that bad teeth are always bad. I do not believe that teeth that are bad in the beginning are bad all through life. I am honest in being mistaken, if I am mistaken, but I believe I have seen changes in the teeth of some of my patients. I call to mind a patient who for ten years suffered from caries of the teeth. He was then leading a sedentary life. He changed his occupation, becoming a railroad man, thus securing plenty of air and exercise. His teeth before required constant care. Now he will go sometimes for five or more years without a single cavity in his teeth. He is an unprofitable patient because his teeth do not require any care. Dr. Black would say that they could not change for the better.—DR. EDWIN T. DARBY.

CHRISTIAN SCIENCE HELPFUL IN DENTAL PRACTICE.—The application of Christian Science to the practice of dentistry, I at first thought one of the impossibilities, but with my little understanding I desire to say that it applies better than I could have even hoped

¹ The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 1338 Walnut Street, Philadelphia.

for. It has enabled me to do more work, do it better, and with less fatigue than I ever did before.

It has enabled me to allay the fear of my patients to that extent that I hardly know what it is to have an irritated and troublesome patient in the chair. In the handling of children I operate with almost as much ease as with the ordinary adult, provided I can have the child away from the parents, who generally insist on standing at the chair, forcing the child into the idea that the work is very painful.—DR. CHARLES VAN FOSSEN in *Items of Interest*.

CONCERNING FEES.—One of the first things for a patient to learn is that the remuneration for the services of a dentist cannot be understood from the stand-point of merchandising. That is, the services and the fees are not governed by the usual laws of trade. The exchange of values does not constitute a barter or sale. Value is given and money is received by the dentist, but the exchange is unequal. The services, involving, as they do, the comfort, the health, and at times in no slight degree the life of the patient, are inestimable, therefore the money received does not pay for them.—DR. L. ASHLEY FAUGHT.

Not the least valuable item on the inventory of the dentist's stock is his precious moments,—sixty of which make an hour,—for every one of which he should receive compensation when reserved for patrons and the appointment is broken without reasonable notice,—and reasonable notice is not one minute or one hour.

The fees charged should, therefore, be reasonably commensurate with the foregoing facts and the substantial character of the service rendered.—DR. A. B. FREEMAN.

ALCOHOL AS A DISINFECTANT.—Recent researches seem to show that absolute alcohol is devoid of all disinfectant properties. Proof spirit (fifty per cent.) gives more tangible results in this direction than either stronger or weaker solutions. Antiseptic substances, which in aqueous solution are more or less active germicides, entirely lose this property when dissolved in strong alcohol. But on the other hand corrosive sublimate, carbolic acid, lysol, and thymol dissolved in a fifty-per-cent. solution alcohol disinfect better than aqueous solutions of the same strength.—*Medical Press and Circular*.

SALIVARY CALCULUS IN THE PAROTID DUCT.—Dr. T. E. Constant, in the *Journal of the British Association*, reports a case where the accumulation of calculus in the parotid duct caused symptoms simulating alveolar abscess. The patient called upon him to have a tooth extracted. The left cheek was considerably swollen, which swelling had commenced three days previous. He says the cheek was both painful and tender, but the skin, although tense, was not reddened. The swelling was most prominent in the centre of the cheek. Pressure over the region of the left parotid caused pain. The patient was very nervous, and examination of the mouth in consequence was somewhat difficult. The patient said the trouble "commenced with pain in the last tooth in the upper jaw,"—viz., the left upper second molar. When that tooth was gently tapped she complained of pain, although it was apparently a sound tooth. She said it had been very painful in eating during the last three days. Careful examination, however, enabled me to assure myself that the swelling in the cheek was not connected with either the upper or the lower jaw, and I noted a grayish appearance at the most prominent part of the swelling in the mucous surface of the cheek.

At first I thought it was a commencing slough, but subsequently found it to be due to something white showing through the mucous membrane. With some difficulty I passed a probe into the parotid duct and was able to dislodge a small calculus, about the size of a one-grain cocaine tabloid and very much of that shape. I saw the patient again two days later, when the swelling had completely subsided, and the mouth "felt perfectly comfortable."

BOARD OF CENSORS IN PLACE OF EXAMINING BOARDS.—From Dr. B. F. Arrington's recent contribution to this journal we take the following:

"In place of examining boards I will suggest that each State create a board of censors, to whom shall be reported any and all cases of malpractice or improper professional conduct, and before whom the accused may and shall confront his accusers, and, if convicted, shall be suspended or barred the privilege to practise in the State in which the offence was committed; and the secretary of the board of censors shall be required to report proceedings and ruling, with seal of office, to every other board in the several States, who shall place on file and furnish copy to secretary of State dental association or society, to be read at ensuing meeting. By

such a procedure the unworthy could be rightly dealt with, the public protected more securely, and the profession sustained better than by the present provision and arrangement of examining boards."

ADDITIONAL DENTAL COLLEGES NOT AN EDUCATIONAL NECESSITY.—In an essay presented at the forty-eighth annual meeting of the American Medical Association, Dr. Richard Grady said that the dental schools are not being formed now from an educational necessity.

Two impulses control this matter,—1, personal ambition to have a position in and be connected with a dental school, for the prominence it is supposed to give; and, 2, a purely commercial spirit on the part of medical schools. Over 60 per cent. of our schools are appendages to medical institutions; and nearly every dental school started in these later years has been under this outside influence.

Current News.

SOUTHERN CALIFORNIA DENTAL ASSOCIATION.

THE meeting was called to order at 2.30 p.m., the President, Dr. W. A. Smith, in the chair.

The address of welcome was delivered by Dr. Emma T. Read, San Diego.

This was followed by the president's address.

The following papers were read:

"How I fill Root-Canals with Bibulous Paper Points." By Dr. E. W. Sheriff, San Diego.

"Peridental Inflammation." By Dr. Edgar Palmer, Los Angeles.

"Relation of Dentistry to Medicine." By P. C. Remondino, M.D., San Diego.

"Dental Education." By Dr. H. R. Harbison, San Diego.

"Dental Education." By Dr. E. L. Townsend, Los Angeles.

CLINICS.

Quick mode of gold and silver plating for regulating appliances. Dr. H. R. Harbison, San Diego.

Preparing casts with aluminum as a lining for rubber plates. Dr. J. A. Cronkhite, Los Angeles.

Anchorage in Orthodontia. By Dr. D. R. Wilder, Los Angeles. This was in the form of a talk, the doctor using the black-board to illustrate his method.

Dr. George H. Cushing, formerly of Chicago, was elected to honorary membership.

This being the first annual meeting, over fifty members of the profession signed the membership roll.

It was the largest dental meeting ever held in Southern California, and speaks well for the society's future.

ELECTION OF OFFICERS.

All of the old officers were re-elected, as follows:

President, W. A. Smith, D.D.S., Los Angeles; First Vice-President, H. R. Harbison, D.D.S., San Diego; Second Vice-President, Dr. C. W. Sylvester, Riverside; Treasurer, Dr. J. M. White, Los Angeles; Secretary, L. E. Ford, D.D.S., Los Angeles.

The meeting adjourned to meet in Los Angeles the first Tuesday in October, 1899.

L. E. FORD, D.D.S.,

Secretary.

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Original Communications.¹

INDEPENDENT JOURNALISM FROM A DENTAL STAND-POINT.²

BY GEORGE S. ALLAN, A.B., D.D.S., NEW YORK CITY.

MR. PRESIDENT AND MEMBERS OF THE AMERICAN ACADEMY OF DENTAL SCIENCE,—For years the profession of dentistry has been drifting, drifting, but, nevertheless, advancing, moving onward; now heading, in its haphazard voyage, for one port, now for another, without guidance, without direction; gaining knowledge and skill, but not knowing where to seek a permanent harbor; gathering, on its varied craft, a rich fruitage of possibilities for benefiting mankind, but, alas! not owning a reliable ship to place it in, nor having a captain to take command. No one questions that dentistry is a branch of the healing art, and a most important one, but dentists are recognized as doctors only in name. The dental diploma neither admits the possessor to membership in medical societies nor gives him the benefits and advantages which rightly belong to him as an integral factor in one of the most learned, and, from a humanitarian stand-point, most appreciated and honored of the professions. All recognize this fact, but only a few see clearly why it is so, or are in

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before the American Academy of Dental Science, May 4, 1898.

a position to point out the road to reform and to lead the way. If dentists have lost their birthright, they may be certain that the fault lies, not with their parents, but with inherent views and habits of the offspring. Man loves life, and this love of life and health sought a mate and found it. The mate was called Knowledge,—knowledge of the laws governing life and health, and of the means for regulating and controlling them. The child of this "love of life" and its mate, Knowledge, was called Medicine. But medicine does not call one part of the body essential and important, and another not so. It does recognize differences in degrees of importance and value, but at the same time clearly asserts that all are mutually related to and dependent on each other. The truth is, the teeth are all-important for health and comfort, and their good or bad condition makes for human happiness or the reverse, and the dentist in no way occupies a second position in the great domain of the healing art. Why, then, does he willingly take a back seat? What influences are at work to keep him from his birthright, and what can be done to overcome them?

Burns, who sang so sweetly on many themes,—alas, that he should have left the world so young in years!—saw clearly many things relating to human life, and one want of power he most beautifully and strongly presents to us in his memorable lines,—

"Oh, wad some power the giftie gie us
To see oursel's as others see us!
It wad frae monie a blunder free us,
And foolish notion."

There is much wisdom in this homely verse. Let us try to avail ourselves of it by putting ourselves outside of our daily life, and endeavoring to take a correct view of things as they are.

First, dentists do not practise their art *ex cathedra*. As a class they do not hold medical diplomas. There are many reasons for this, some good, some bad, but the parent profession is in no way responsible for any of them. At all times that profession has been ready and willing to extend to us a welcome, acknowledging the right and justice of our claims, but at the same time it has said that we were not entitled to special privileges. In other words, recognition could not be extended to any but those who hold the medical diploma, and to obtain that a special course of study and preparation was necessary. So soon as dentists put themselves in line with the other branches of medicine they would be received into the fold. No criticism can be made on this action, or lack of

action, on the part of the medical profession. If they should open the doors to us without this formality, it would not be long before the oculist, the gynecologist, and all other specialists would be claiming the same rights, and there would be an end to the unity of the profession. But there is no time to discuss this phase of the question. In good time the operation of natural laws will bring about its proper solution. It remains for us only to prepare the way, as far as possible, to remove obstacles, and trust to time and the normal growth of the profession on general principles to complete the work. Then we can and will take our right position naturally and easily. It is the part of wisdom, then, to order our lives and conduct in such a way that when the time comes we shall be ready for it.

To practise medicine two things are essential: first, the diploma, which means that the holder has taken the prescribed course of study and passed his examinations; second, that he shall live up to a special code of ethics; and these latter are based not on moral law only, but have added to them certain other principles, the meaning of which is that those who practise the healing art must order their lives and practice on different lines from those who engage in commerce and trade. These latter laws say that the physician occupies a different position in offering his services to suffering humanity from the merchant selling his goods. I do not for a moment suppose that the medical code of ethics implies any claim, on the part of the medical profession, that its members occupy any higher ground in the moral law than other workers do. The moral law is for all humanity. It governs and controls all alike. Therefore these additions to the moral law, which, after all, are the groundwork, the warp and the woof, of the whole code, are intended only for regulating the life and work of doctors on certain prescribed lines. They are the result of years of study and thought, they are fundamentally correct, they exert a most salutary and beneficial influence, and they are far more likely in the future to be strengthened and added to than to be dropped. The reason for this it is not at all necessary in this place to enter into. All of you are acquainted with the rules of the medical code, and their meaning and power for good. We have but to accept them as truisms.

In what respects do the dental codes of ethics differ from those of medicine? and—what is more to the purpose—to what extent does the profession enforce them? These are pertinent questions at this time.

It may be stated that dental codes do not differ in essentials from medical codes, but in their enforcement there is a wide difference. The former, to a great extent, are dead letters, and little or no attention is paid to them; and for this sad condition there is but one explanation,—the profession, as a whole, does not believe in them. Just the contrary condition holds with physicians as a class. As a whole, they do believe in codes, written or unwritten, and their rigid enforcement follows, as a matter of course, without question. The *esprit de corps* is alive and active in the one case, and nearly inanimate in the other. The tendency in the one case is to detach the profession entirely from trade influences, and to black-list without mercy those who hold to them. In the other it is to make use of such influences, if not openly, at least covertly, and to excuse those who employ them. Few of those who are posted and have given the subject any attention will question this broad statement. So it amounts to this: dentists are not doctors, first, because they do not hold the medical diploma, and, secondly, for the reason that they do not believe in or live up to the medical code of ethics. *In posse* they are doctors, *in esse* they are not; they occupy a sort of border-land, and so do not hold the respect or confidence of either of their neighbors. The right hand of fellowship and comradeship is not extended to them by either party, and so, perforce, they have to, as the saying is, meet with themselves.

Some of our brothers seem to be happy in the idea that we are sufficient unto ourselves, and that we neither want to nor can be benefited by any alliance with medicine in general; that it is better to "go it alone," and so gain in self-respect and strength of character, power, and influence.

Well, I wish some of those who profess this belief would show us just where the line of separation between doctors and dentists can be placed, or give us a satisfactory definition,—the term of a specialty of medicine, one that would exclude dentists, and at the same time admit the hosts of other specialists that seek refuge under the paternal roof; or possibly they can tell us why, if it is better for us to live independent lives, it would not be equally advantageous for some of our professional relations to follow the same course, and why they do not endeavor to break the shackles that deprive them of a coveted liberty like unto that which makes us happy and prosperous. Are they blind, or only stupid? Or is there a real or fundamental difference between our callings? Is there an actual difference between the tissues and organs of the mouth and other parts of the body? One so radical that he who

provides for the health and comfort of the dental organs and adjacent related parts must needs have a different title and position from his brothers?

If a good and sufficient answer cannot be given to these queries, then there is no reason why we should not seek our relations. If "blood is thicker than water in human affairs," so like views of life, its duties and responsibilities, should join together in an harmonious whole those who seek common ends.

Those who practise dentistry as an "art" must needs coin a new definition of the word if they wish to make it appear that they practise on lines different in any of its essentials, except in degree, from those who are disciples of the "healing art." The use of the term simply misleads. The desire is evidently to push to the front the æsthetic meaning of the word and give it undue prominence.

It would appear, then, that those who aim to broaden the lines of their work by merging their specialty in the general practice of medicine are but seeking that which is rightfully theirs already. In no sense of the word can it be said that they are trying to push in where they are not wanted, or that they are toadying to any set or class of men. They simply demand recognition of what they are,—nothing different, either better or worse. When they have obtained this, then they will be fully prepared to do their full share of all the work demanded of them, to accept their responsibilities, and give a full equivalent for all benefits derived.

If as much attention were given to the anatomy, physiology, and pathology of the teeth in the regular courses of medicine as is given to other parts and organs of the body, much benefit would accrue to both the general practitioner and to the specialist. The former would not make the many mistakes and blunders in diagnosis and treatment to which we dentists so frequently have our attention called. It is not an uncommon thing for the dentist to think, "If Dr. X. does not know any more about the other organs of the body than he does about the teeth, I am sorry for his patients." On the other hand, if the dentist were educated as a doctor, and his professional education founded on the principle that the teeth in no essential respect differ from the other organs of the body,—that they are living parts of a living whole,—he would not be less of a mechanic, but he would be more of a physician, and so every one concerned would be benefited, humanity most of all.

It is more than probable that the condition of affairs of which I have spoken is largely due to inherent causes, those that operate from within the profession and have their origin in the nature of

the services rendered, which are largely mechanical, calling for special tools and appliances; these in turn force the dentist to be a mechanic, and cleverly and rightly encourage the inventive genius. The dentist who invents something new and valuable, not being held in control by the professional code, naturally seeks to profit by his labors and study, and is sorely tempted to take out a patent. As conditions are, I, for one, do not much blame him for the position he takes. We can hardly hope to see a rule that does not hold all in its grasp enforced from sentimental reasons only. Self-interest is all-powerful, and the ready excuse, "I am only doing what others do," is ever ready as a salve to the conscience. To the great credit of the profession, however, it can be safely said that it is steadily turning its face against the practice, and few self-respecting dentists to-day can be found who will either countenance the practice in others or make use of it themselves.

Of all the influences that have operated to the disadvantage of the profession and have tended to keep it away from the true professional standard, no one can be compared with that of the dental depots. These great establishments are organized and conducted on a strictly commercial and trade basis, and naturally and rightly conduct their business on laws and methods governing such establishments. They seek first of all their own good, look to their own interests, and care nothing for the advancement of the profession except in such ways as will add to the volume of their sales and their annual credit balance. No fault can be found with this fact, either as to its truth or the principles involved. The proprietors of these depots are in the business to make money, and it is folly to suppose for an instant that any other motive to any great extent influences them, or that they could be expected to part with any trade advantage for the sake of the professional *esprit de corps* among their customers. I see no reason to question their right to manage their business in their own way so long as they do not offend the general moral law; and, as a whole, I think they are managed honorably and justly, and aim to give, as they do give, a fair return for the cash received over the counter. Those I have known—the best—have been men of high character, and trustworthy in all business dealings. Still, I do not hesitate to say that the profession has lost more in prestige and power than it has gained in all other ways by the too intimate relations that have existed heretofore between it and these concerns. This relation has been a curious one, almost unique, for I doubt whether its like can be paralleled elsewhere. The depot has been an ever-present

power, more so in the past than in the present, and the profession has taken kindly to its presence, guidance, and help in its various gatherings and conventions; has sought the depot's aid and taken its cash on many occasions when clouds seemed to be gathering and the future looked full of trouble. It is foolish to ask what were the motives of the depot managers on these occasions. It is just possible that they placed their money where they thought it would do the most good; and it is possible, for those who care to think so, that they were governed by high and generous motives. What was the opinion of the greatest among them, and the one who profited the most by his connection, may be judged by his indignant rejoinder to a question I put to him; asking me, "Where would the dental profession be to-day if it had not been for this great establishment?" Evidently he had the impression that if it had not been for the care, attention, and devotion of the foster-mother, the great establishment of which he was the head, the profession would still be in the pangs and dangers of parturition. I well remember the strong inclination I had to tell him that it was just possible that the care and attention the profession had received had not been altogether in the right direction; that it had been led into unnatural and erroneous ways, and that a good bit of manly, healthy vigor had been lost by the over-zealous and not altogether disinterested care bestowed.

The trade influence has kept alive and encouraged the whole system of patents and analogous methods, which are entirely anti-professional, if not absolutely ruinous to all the instincts and traditions and special laws of such a life; and, as if this were not enough, the whole system has been of a character which, while encouraging the individual, has defrauded the profession of such benefits as would follow were competition open and patents not allowed.

To the individual who has hit on a new device or principle, and has no scruples to benefit thereby, the manufacturer offers the customary royalty, gives him all the credit for his invention, pats him on the back, and tells him that he has a right to claim that which is justly his due as a result of his brain-work and study. To the unfortunate, who has some professional pride and feeling, he offers another bait,—one more suitable to his refined nature; it is somewhat like this, "Your views are quite right, and I respect your principles, but do you not see that in case the manufacturer is not protected, he cannot afford to give his time and capital to turning out goods when his competitors can at any time step in and compel him to share the profits thereon by manufacturing them them-

selves? It will require special tools and skilled labor to make a finished article, and these must be paid for, and if these are not given your invention will fall flat and you will get neither cash nor reputation. Now, if you will take out a patent on this valuable appliance and give me the sole right of manufacture, I will see to it that the goods are well and properly made according to your directions, and will charge only a fair manufacturer's profit, minus the royalty that would otherwise have gone to you." This bait has caught many well-meaning brothers, who have repented at leisure and in sorrow when they have found that they bartered their heritage of principles for a mess of pottage, and that their protestations of innocence and of good intentions were only, at best, half believed, and who with clearer vision have been made to see that open competition would have compelled a manufacturer to do his best to hold the market; that the invention, if valuable, would have pushed its own way, and that many sources of supply would have added to his credit and reputation by making it more widely known and appreciated.

A valid patent gives the holder thereof the sole right to manufacture at such times and in such quantities as may suit his convenience or expected gain. The working of this law has resulted in depriving dentists of the aid, advantage, and benefit of many valuable and helpful tools and methods of practice. For, as often happens, one invention is likely to interfere with another which accomplishes the same purpose in a different and perhaps simpler way. Of course, the manufacturer who has capital invested in one invention does not want to be interfered with by a rival, and so buys up the new invention and locks it up until such time as he can safely and prudently allow it to see the light. In this way the profession, as a whole, has suffered greatly, and out of all proportion to any benefits derived.

I have wandered too far from the real purpose of this paper, and now ask your attention to consider with me the true meaning and influence of the terms "independent" and "trade" as applied to journalism.

It is rather a startling assertion to make, still I make it unhesitatingly and without a doubt as to the correctness of my position, that the depots have captured our literature, and have been and are using it solely for mercenary trade purposes, and that in all doubtful cases or questions, the good of the trade takes precedence of the good of the profession. Now the literature of any profession or calling in life ought to be kept clean and pure and free from ad-

mixture with deteriorating influences. It should neither directly nor indirectly give aid or support to those who differ from it in the essentials of its life and being. Least of all should it be allowed to become the main support of any manufacturing establishment in pushing its wares on the market. The holding of these views does not in any way militate against an independent journal devoting a certain number of its pages to advertisements, accepting those that properly belong to its purposes,—those that will add to its value and help its income. But the literary department should control and direct the advertising department, and that is a vastly different state of affairs from that in which the trade department controls and manages the literary department, and uses it simply as a means of pushing its advertisements where they will do the most good. The art of advertising is important and valuable just in proportion as it can be made to attract the eye and reach the proper class of readers, and business men devote large sums of money for these purposes and employ special talent to make their announcements attractive. The dental depots save the greater part of this outlay, the dentists themselves kindly furnishing in most cases the special talent, gratuitously at that, and then paying for the “advertisements” in cash subscriptions for the magazine. No other class of business men are so fortunately situated as these publishers. They get much for little and have the laugh all to themselves! The subscriptions pay the bills and the advertisements cost them nothing or next to nothing. And yet you will find dentists and classes of dentists and societies who support this very pretty arrangement and say it is all right and “so handy.” The depots appreciate all their advantages, but do not change their colors; they are the same old tradesmen,—just the same, and the tradesmen’s codes of ethics, and those only, regulate their business life.

But this is not all. The former editor of one of our leading journals openly claims that his journal had made the reputations of many of the prominent members of our profession. He believes what he says, and, as the men were worthy of the honors conferred, feels naturally proud of his work. I do not question the correctness of his statement; but when I first heard it, the thought came into my mind, Cannot the same power that makes one man’s reputation destroy another’s, or keep him from obtaining his just dues? and is it right or proper to put so great a power for good or evil in the hands of those not guided and controlled by the same code of ethics that we live under? Think of it. Tell me, if you can, honestly, whether such power should live outside our ranks?

Much stress has been laid on the claim made by the leading trade journals that the editors are free to manage their department as they think best. True, indeed, to a great extent, but in all these cases the editor has no control whatever over the advertising pages, —in fact, has nothing to do with them. So these journals at the best are only half professional, and the other half trade; and when you come to think of it, they are literally all trade; for the sweeter, the more pleasant, and the more digestible the editor makes his pages, the more push the whole will have in the right direction; and that is his special business. How blind must a man be who cannot see through so big a hole! No wonder all dental depots want a journal, and want it badly; for their success and life depend on it. Years ago, one of the heads of a depot, now out of existence, said to me, "I want an organ and must have one, or I cannot compete with these big fellows." Shortly after he started one,—he had to,—but success did not go his way, and he gave up the fight.

The plea made by those who support the trade journals is that few or none of the dental societies can afford to publish their own proceedings; they have not the means, and therefore it is a matter of necessity to give them to the trade journals, and a few societies—to their shame be it said—accept pay for them. Well, it does look, as the saying is, rather "off color" for a reputable society to sell its proceedings. But think a little: in what respect, but one of degree, does the society that sells its proceedings for cash differ from the one that gives its proceedings to the same journals? In the one case the society gets its proceedings published free of cost; in the other, it obtains the same advantages plus so much cash. In both cases it amounts to so much cash in pocket, and that is all. No, it is not all. There are some things that honorable men do not sell, least of all are they willing to sell their principles.

"Who steals my purse steals trash;
But he that filches from me my good name
Robs me of that which not enriches him
And makes me poor indeed."

Honorable men will not part with any of their self-respect, not for cash, at all events.

Taking the most charitable view of the case possible, the society which gives its proceedings to a trade journal puts itself under obligations to that journal. Well, some do not relish the thought of accepting such obligations, and do not rest content when they have to accept them. They become restless and discontented, and make

every effort to get rid of them, for they find themselves in a false position. There is an old saying that he who accepts a favor must take a kick before he can get rid of it. It seems to me that our profession has got its kick, but it has not got rid of the obligation. It may serve our purpose to make a direct comparison between the two classes of dental journals.

The trade journal is in all essentials the organ of some dental depot or manufacturing concern. It is made for profit, published purely as a matter of business, and as a whole is simply an advertising medium connecting the dental depot and its customers. For convenience and policy's sake it is divided into two parts, the literary and the advertising. The advertisements alone would have no push or power, and would in a great measure fall flat, and find a quick burial in the waste-paper basket. Even if glanced at, or partly read, they would quickly be forgotten or mislaid. They must be kept alive, in evidence, ready for reference, and where they can be seen, or they will fail. So the literary department is most wisely attached to rescue the advertisements from their inherent weakness, to give them life, character, influence, and the power of self-preservation. The dentist takes his journal in order to keep himself posted in matters relating to his calling. He feels that he must keep abreast of the times, and prides himself on his ability to give his patients the full benefit of the labors and thoughts of his fellow-workers; and for their value in this way the papers are kept for reference and study, and they are kept in whole and not in part. Nominally, the literary part of the journal is of first importance, but in reality the advertising half holds that position, and the journal would have no meaning to the publishers if this relationship did not exist. Now, I, for one, hold that it is a palpable infraction of the moral law for a trade journal to print on its title page "A monthly record of dental science, devoted to the interests of the profession." More honest and correct would it be if made to read, "A monthly record of dental science, published in the interest and for the benefit of the X Y Z dental depot." I strenuously object to seeing the professional flag floating over a trade fortress. It may look pretty, but it is sadly out of place. It is deceptive and hides a masked battery.

The independent journal stands for quite a different thing. It stands for the profession and the profession only. It means the absolute control of the advertising as well as the literary matter, and means that the latter should in fact as well as in name be the essential part of its existence. In no way whatever should it be

published for profit, except inasmuch as the profession may reap the whole profit thereof. Every dollar received in excess of the cost of manufacture should be turned into the common fund, and be used solely for improving the journal or as a safety fund. It should not be allowed to contribute to the profit or advancement of any individual or class. The journal should float its own colors and fight for them. A high professional standard should be insisted on, and advocated in all proper ways, by example as well as precept.

A journal or journals—and they should be many—so conducted and supported by the profession ought to have and would have a marked influence for good, and go far towards relieving the profession from the trade-influence incubus it now labors under.

In 1890—I speak from memory—I had the satisfaction of having a contribution on this subject refused by the *Dental Cosmos*. The reasons given were trade reasons only, and had nothing to do with the real merit of the article, which, indeed, was admitted. Before sending it, it was submitted to several of our leading men and by them fully endorsed in all respects. This is not an isolated case.

It is curious how habit and custom confuse thought and blunt the moral perceptions. For so long a time have dentists either given away their literature, or marketed it to the highest bidder, that they have ceased to consider the highest questions involved, or the obligations they rest under to the profession as a whole.

The strong societies ought to meet the issue fairly and squarely, set the fashion, and pay their way, including the salary of the editor, and then the weaker ones will gradually fall into line to the extent of their ability; all will gain thereby in self-respect and in influence. The editor of a trade journal is employed by the depot managers—his salary is paid by them—and is in all essentials their servant. Can he serve two masters? The greatest of all authorities says, *No!* No matter what his impulses or ambitions may be, he is not, and in fact cannot be, a free man.

As a rule, mankind values most that which costs the most. If dental literature is valuable to the depot managers as a means for selling their goods, it needs must have as great or a greater value to the profession for disseminating knowledge and principles. It is most reasonable, then, for the societies to pay a little more and keep the reins in their own hands,—in other words, to pay a journal owned and supported by the profession a fair sum for publishing their articles. Even were they to gain in no other way by so doing, they would gain much in self-respect, and that in this instance amounts to a great deal. But a greater good lies hidden under this

little matter of dollars and cents. I have too great faith in my brothers to believe that when they once fairly grasp the principles involved they will longer submit to their unworthy thralldom.

In what I have said there may be some strong or even harsh expressions. If they so appear to any of you, kindly overlook them, and credit me only with a strong and earnest desire to advance our common interests, ambitions, and hopes on correct lines.

I know of many good men who hold contrary views from those which I have expressed, and I respect them and their views, for they are as honest as I am, and equally desirous of advancing the good cause. I am sorry that this difference of opinion exists. In the end the right and the best will prevail.

Rossini, in his famous opera, "The Barber of Seville," written in the early part of this century, puts into the mouth of Figaro, where he boasts of his skill, "I am barber, surgeon, and jack of all trades, and my pockets are never empty," and later on he says he knows all about the people, as he is barber, hair-dresser, surgeon, and major-domo of the household. At this period the surgeon and the dentist occupied similar positions; neither commanded the respect of the people. They were tinkers, and tinkers only. As time went on, the surgeons, step by step, advanced, and, joining hands with the physician, pushed their department of medicine into great prominence, and to-day no class of men can claim a prouder position than they. Times have indeed changed with the surgeon, but the calling of the dentist still lags behind.

If, now, you will turn to your copy of the Century Dictionary, the last edition of which has but recently been published, you will find that a dentist is "one whose profession it is to clean and extract teeth, repair them when diseased, and replace them, when necessary, by artificial ones; one who practises dental surgery and mechanical dentistry."

How do you like the pen-picture which this great authority places before your eyes? The first definition given in a dictionary is generally the main one, the one commonly accepted as correct. The definition quoted is not quite up to date so far as the opinions of some of you are concerned; but, alas! we must take the position assigned to us by the combined verdict of the masses, and, in the main, I believe the masses judge rightly, for their judgment is founded on that estimate which any man or set of men place on themselves and live up to.

In the early dawn of the twentieth century I hope to see the definition read something in this way: "Dentistry is a specialty in

medicine, dealing with the oral cavity, with especial reference to the medical and surgical treatment of the teeth." If that good day is to come, as soon I hope and believe it will, then we must meet together with a common purpose and work for what we believe. The fountain-heads of instruction, our colleges, societies, and journals, must be made to push the thought and principle both by precept and example. The student must grow up with the thought that he is in fact a doctor of medicine,—not half doctor and half tinker. The time for push and work is at hand, and all lovers of their profession should take part and not rest till the prize is won.

"There is a tide in the affairs of men
Which, taken at the flood, leads on to fortune;
Omitted, all the voyage of their life
Is bound in shallows and in miseries."

Gentlemen, I believe the tide is now in our favor, and that the time for work is at hand. The subject, as has been well said, is in the air, and it needs but a strong and united effort to mount the crest of the wave that will lead us on to fortune. The faith that is in us must be fought for earnestly, hopefully, and manfully, and the truth will surely prevail.

ARTIFICIAL DENTURES IN THEIR RELATION TO THE SPEAKING OR THE SINGING VOICE.¹

BY DWIGHT L. HUBBARD, M.D., NEW YORK.

To the crowning glory of the handiwork of the Creator is given that which none of the lower animals possesses,—viz., a power to express thought and a soul which finds a medium in articulate sounds. The Giver of this faculty gave to other creatures the same power in less degree; to some the intelligible manifestation of fear, pain, anger, and other emotions; to each according to its necessity. But to the greatest of His creatures He gave not only the power of expressing emotion by sign or articulate sound, but the power of original and logical thought in speech and song. In order, therefore, to treat this subject intelligently it may be well to indulge ourselves in a short consideration of comparative anatomy. Every

¹ Read before the Northeastern Dental Association, held at Hartford, Conn., October 19 and 20, 1898.

bird, every animal, is endowed with a voice according to its need. To some it is given for self-protection, for the acquirement of food, for the warning of impending danger; to others, of a higher type, for pleasure, for companionship, and for ministration to man and the glory of the Creator. Each and every one according to the necessity of its environment.

The beautiful song of the nightingale has its use in innocent glorification as well as in a contribution to poetic æstheticism. Let us look at the subject from a mechanical stand-point. It is very pleasant to dwell upon higher and æsthetic things, but serious business calls us from the realms of the beautiful, and reminds us that man lives by bread, but does not live by bread alone.

The voice is the highest type of mechanism in acoustics.

The squirrel, chipmonk, and others of the same family have voices sharp and shrill, but there is no resonance. They have flattened heads and very few resonance-chambers. The jackass (pardon me for so commonplace a reference) has a resonance capable of disturbing the peace of solitary dwelling-places or the minds of adjoining neighbors, either of his own kind or of a higher order. He has a large head when compared with his body. He has wide and large nasal cavities. He has a "large" voice with great carrying quality. The crow has a voice in quality and timbre far from musical, and represents a type of the "throaty" voice. This bird has a flattened head and no resonance-chambers. The canary has a voice of great sweetness and resonance. He has a high forehead and a comparatively enormous frontal sinus. The parrot has a voice of penetrating and carrying quality, and in accordance it will be observed that his beak is altogether in harmony with his vocal resonance, giving a remarkable variation almost human. Observe the resonance-chambers of the owl, and go to his haunts and be charmed by his music. The high and wide resonance-chambers of the lark have justly earned for him poetic tributes. H. H. Boyesen thus writes:

"The bird is to him but a winged symbol of divine unrest. The lark has caught the key-note of the poet's song and loses its earthly individuality."

Take exception, if you will, in the case of the bullfrog, but look at the air-pouch in his white throat. It is out of all proportion to the size of his head. His deep diapason may put to shame the attempts of a contrabasso.

So in man, resonance-chambers are a necessity to good voice-production. The high forehead with its frontal sinus, the porous

bones of the upper face, honey-combed with cells, the thirty-six square inches of nasal space, the vaulted dome of the naso-pharynx, all lend resonance to the thought medium. The anatomical construction of the face and head should not be forgotten.

It should be borne in mind that hyperplastic inflammation of the lymphatic glands of the pharyngeal, laryngeal, and cervical regions is liable to take place as the result of disturbances in the teeth and also in contiguous structures. Neither should the extension of possible inflammation to the sinuses be neglected. The relationship of these cavities to the parts named is very intimate. We have only a thin mucous membrane covering the palatal foramen, and a direct communication with the antrum of Highmore with the nasal cavity. These are in intimate association with the oral cavity. So with the other sinuses, the frontal connecting with the nasal cavity by means of the infundibulum, as pointed out particularly by Dr. Fillebrown; the ethmoidal cells in direct communication with the nasal chambers and the sphenoidal sinus, very liable to disease from extending catarrhal affections; all of which may be caused by tooth-disturbances. I speak of these only because they have a direct bearing upon voice-production, and to particularly fix a partial responsibility upon those whose business it is to look after primary causes.

In order to prove that vibration of the air in the nasal cavity takes place during phonation, place a vulcanized rubber splint of small size in the nostril, and upon phonation the singing quality and the vibration will be plainly felt. To demonstrate that a part of this vibration is communicated through the palatal bones and foramen, hold against the hard palate a sufficiently large piece of wax, and the diminution in the nasal and head vibration will be very noticeable. I wish merely to show that artificial appliances in the roof of the mouth are hinderances to proper phonation, and that some attention should be given to the avoidance of such possibilities. Aside from the soul of music in the singer, everything depends upon the tone-placement. No obstruction, no matter how slight, should be placed in the way, whether it be an obturator, a plate, or a simple filling, unless necessary. When necessary, due attention should be given to the best tone-producer, whether it be required for grand opera, the rostrum, or common conversation. As the crowning work man stands unique in that he must *learn* the art of speech and song; but is not this a tribute to his greater intelligence? How much more, then, should he seek to acquire perfectness in this one of the highest gifts.

What relation have artificial dentures to these cavities? When a violin string becomes "fuzzy" the tone is muffled. It no longer gives forth a clear note. Puncture a brass instrument and solder it with lead, and its clarion notes lose their clearness. Place an iron weight upon the sounding-board of a piano, and it ceases to give forth the harmonies of the mind of its master. The human vocal instrument can no more tolerate these obstructions than can those used in the illustrations.

I will not refer to pathological conditions, nor enter into a discussion of them, except as they place hinderances in the way of clear voice-production and the necessity for their recognition in the fitting of dentures and of dental operations in general. *Apropos* to what has already been said, let us take as our first principle that the resonance-chambers must be free from all obstruction. By resonance-chambers I refer to all the cavities of the face, including the nasal and naso-pharyngeal spaces and the oral cavity. The last is not least in importance.

Teachers of elocution and singing-masters lay particular stress upon "tone-placement." By this is meant such a focussing of sound-waves that the air in the spaces referred to may be made to vibrate the most readily. This gives carrying power to the voice. In other words, the air of an auditorium can be made to vibrate only when the vibration is started in the vocal mechanism. The vocal cords simply act as the initial mechanism of the tone, the resonance-chambers being really the tone-producers. Vocal cords alone are nothing more than a violin-string without the body of the violin. The choicest place for focussing sound-waves seems to be in the palatal arch, its exact location varying in different individuals according to the shape of the arch and the size and relative positions of the different sinuses. The palatal arch is a most interesting locality to the dentist. At this point a good or bad denture may retain, make, or mar the tone quality and timbre. It is a self-evident fact, then, that perfect fitting and perfect finish are of great importance. Second, it is of no less importance that we should consider the quality of material used as also the material itself. It follows that as little interference as possible to the conduction of sound should be placed in the way. The focus of vibration at the point mentioned is largely instrumental in communicating sympathetic vibration to the nasal cavity. For perfect fitting you, of the dental profession, must be depended upon, for with reference to this I cannot speak with authority. As to the material to be used I have but little to say, but that little will be from experience. We

know that vulcanized rubber is almost as poor a conductor of sound as it is of electricity. We know that porosity hinders the conduction of sound and that density increases it. The metals whose chief characteristic is that of fibrous density are the best conductors. But it is sometimes easy to do our work too well. Suppose we could use a plate of steel. We would thus overdo the work and get too much of the metallic conduction out of all proportion to the capacity of the resonance-chambers. Then we must look for a happy medium which will be proportionate in their capacity. The material must be neither too soft nor too dense. Its density must be varied according to the individual case, other necessary things being also considered as a matter of course. You have reached such a stage of perfection in the management of gold that it is now a comparatively easy thing to obtain the proper and desired density appropriate to each case. But with any metal as a "*back*" it seems to me that a modifier should be used in combination with it. To sum up this part of my subject, it would seem that a vulcanite plate of perfect finish, as dense as possible, backed with gold of proper density would be an ideal plate.

The same principles should be observed with regard to artificial teeth and fillings. It may be asked if the teeth have anything to do with resonance. In answer, and to prove that they most decidedly do, that the so-called "throaty" voice produces no vibration either in the resonance-chambers or in the teeth, let us observe how the bones of the face must take part in the vibration of properly produced tones, both in speaking and singing. Produce a "throaty" tone, coming only from the larynx, place the teeth of the lower and upper jaws very gently in apposition, and no vibration is felt. Now produce a tone in which all the resonance-chambers are used with the teeth in apposition, and the vibration is so distinctly felt as to become exceedingly uncomfortable. *Apropos* also to this, I would establish the principle that speakers and singers should have good teeth, whether they be natural or artificial; also that the occupation of your patient should be considered. In this regard, advancement in mechanical dentistry has happily furnished good material especially applicable to the cases here considered. How often do we find that nature is so perfectly balanced that discoveries and appliances often cover a wider range of necessities than that for which they were first made.

The above are only hints. I am here as much for the social pleasure of being with you as to try to add to the scientific interests of your meeting. I am reminded that the possibilities for ex-

pansion in the application of dental science are great. As dentistry is rapidly broadening into surgical fields, it may not be assumption to think how it may come to pass that you may some day find it necessary to become elocutionists and singing-masters. "Music hath charms to soothe even the savage breast."

But, seriously, is it not time that we realized the fact that a study of any part of the human body involves necessarily a study of the whole?

May I digress for a moment, and call to your attention that the main pages in our dental journals are devoted largely to some reflections upon some imaginary or real violation of suggested therapeutics; to some proposed theory as to the management of a society, or to ethics in some remote corner of the world? Please pardon me for the suggestion, but would it not be better if we could broadly and optimistically pour the milk of human kindness all over this land, and at the same time think of and act for the good of our fellow-men in the things which will make him physically happier? Surely our efforts would be well repaid in the certainty that we have made him better; the result of which will be the working out of his own individuality, that high ideal for which he was created. Let us live the broader, the higher life.

I have, I know, really said nothing, but if, coming from one who is in sympathy with you as brethren, I have added even the smallest quota of enjoyment or profit, I shall feel that I might have come to a worse place. I shall never hope to go to a better one until the summons comes to go one step higher into the land where dental pathology is unknown and where oral surgery is not required.

TAVEAU'S PÂTE D'ARGENT NOT THE FIRST AMALGAM.

BY WILLIAM H. TRUUMAN, D.D.S., PHILADELPHIA.

THERE seems to be an impression among dental writers in this country that the use of amalgam for filling cavities of decay in human teeth was first suggested by O. Taveau, a dental writer of Paris, about 1826. To show that this is an error, I quote those paragraphs in his work upon which alone the claim may be founded. They are found in a work entitled "*Nouvelle Hygiène de la Bouche*," published at Paris in 1843; the fifth edition, rewritten

and enlarged, of a work first published by him in 1826. On page 232 he enters upon the discussion of materials for filling teeth, giving the advantages and disadvantages of those then in use, and on page 236 introduces the "pâte d'argent," or silver paste, as follows:

"To obviate all these inconveniences, I have used the last seven or eight years, with incontestable advantage, a paste which I have named *pâte d'argent*, the composition of which I at once communicated to our *confrères*. It is the same as that which an English dentist has since pretended to have imported to Paris, giving out that it was something new, and which he improperly proposes to designate by the name 'mineral succedaneum,' a designation which, to say the least, is nonsense, for it does not indicate either its nature or its use. This paste is made of pure silver and mercury.

"To prepare it, we saturate the silver, reduced to a very fine powder, with a given quantity of mercury, rubbing them together until they are perfectly incorporated. We then use it as it is, or, to make it harder, we press strongly the mass enclosed in the skin of a kid deprived of its epiderm, in order to extract all the mercury. The material we obtain by this process is a species of hard paste, but soft enough to yield easily to pressure of the fingers.

"We employ this preparation cold, making it, with a plugger, penetrate and fill the cavity of decay and all its irregularities as perfectly as do the materials used in leaves. The mercury it contains is evaporated by the heat of the mouth alone, and this during the course of the following day, the silver remaining united in one piece within the cavity of the tooth, filling all its anfractuosities, and becoming compact and solid in every part of the cavity. This new means of filling is incontestably superior to all others which we employ at the present time, because, first, the amalgam makes a better filling without requiring so much packing as do the metals in leaves; also, by its use we avoid the application of heat, necessary with the Darcet metal; and, finally, it becomes so hard after a little time, as proved by our experience, that when in the tooth it has all the requisites of a perfect filling.

"The silver paste does not shrink, as we might fear, from the evaporation of the mercury which remains after the surplus has been expressed through the kid-skin, which process leaves a portion almost inappreciable. As for the fears we may have of the action of this portion of mercury upon the teeth, they are absolutely illusive; this we say in reply to M. Lefoulon, seeing that the quantity of mercury which remains is very much less than is con-

tained in the Darcet metal as modified by Regnard, to which it is infinitely superior in hardness."

From the data here given we may reasonably infer that Taveau first used the silver paste about 1835 at the earliest, at which time we have abundant evidence that under various names it was well known and widely used. This work, published in 1843, was, as we have before said, the fifth edition of a work originally published by the same author in 1826; and the question naturally arises, Are these references to silver paste found in any of the earlier editions?

The first edition, entitled "*Hygiène de la Bouche*," or a "Treatise on the Care necessary to keep the Mouth in Order and to conserve the Teeth," dated at Paris, 1826, is a 12mo volume of 208 pages, written for the public, and dedicated to mothers of families. The only reference to materials for filling cavities of decay is found on page 159, where the writer says, "The manner of plugging the teeth (*plomber les dents*) is entirely different to-day from what it was some years ago, when we employed for this purpose lead or gold in leaves, which were introduced by means of a stylet. We now use a hard metal, which, on the approach of a heated iron, not very hot, and without causing the least pain, promptly fuses and spreads within the cavity, filling it in every part. This new method has the immense advantage over the old of, first, filling more exactly the cavity of decay; second, presenting an exterior surface hard and polished; third, of not giving any odor to the mouth; fourth, and finally, it can be quickly done without causing the least pain."

We here recognize the fusible metal of Newton, or the French Darcet metal, composed of three parts of tin, five of lead, and eight of bismuth.

The second edition, also dated 1826, I have not seen.

In the third edition, corrected and enlarged to 276 pages, dated Paris, 1828, beginning on page 198, we find precisely the same words used; a few lines are added, stating that, while the heat necessary for fusing the metal may be noticed for a moment, it is not sufficient to cause the least danger, and that many persons do not notice it at all.

In the fourth edition, dated 1833, enlarged to 288 pages, we find on page 198 precisely the same words as are found in the third edition. In none of these is the silver paste mentioned.

We have further evidence upon this point in a little pamphlet written by Taveau, dated Paris, 1837 (the first edition), entitled

"Notice of a Cement for arresting Caries of the Teeth, and offering a New Mode of Treatment for conserving those which are attacked, without having Recourse to the Extraction of these Precious Organs."¹

He here speaks of the use of gold, tin, and lead, in very thin leaves, and of the fusible or Darcet metal, used for filling cavities of decay. Not a word do we find of "*pâte d'argent*," which surely would have been mentioned if he was at that time in the habit of using it. He was not a man to keep such things to himself, but promptly, as he tells us he felt it his duty to do, he published, that others might enjoy them with him, any new discoveries that he made. In this pamphlet he refers to the fact that the fillings then in use merely replaced lost tissue; they simply protected the diseased part of the tooth from irritating and destructive agents; they were merely mechanical expedients, and were not in themselves curative. He refers to the use of the actual cautery, of acids, of the caustic alkalies, and of nitrate of silver for arresting the progress of caries, and proposes in place of these, as a preparatory filling, a cement composed of anhydrous alum, alcohol, ether, and gum mastic.² This composition, he says, "like hydraulic cement with water, hardens prodigiously in a few hours." He asserts that "two or three applications—more frequently only one—is sufficient to completely destroy the caries and conserve the tooth without pain." There was much confusion in the use of terms among dentists the world over when this was written. Reading between the lines, I am impressed that his proposed cement was intended to produce a species of pulp-mummification, and was most likely employed in cases of either near approach to or actual pulp exposure, not to arrest the progress of caries, as we now understand this expression, but to obtund the sensitiveness of the cavity, so that a filling could be inserted. I have referred to this pamphlet more at length, because its title would naturally lead one to suppose that it treated of cements for filling teeth. It does not, however. It was written for the sole purpose of calling attention to the use of the alum and mastic compound for use in sensitive cavities, preparatory to filling them with other material.

¹ Notice sur un ciment oblitérique pour arrêter et guérir la caries des dents, offrant un mode nouveau de traitement pour conserver celles qui en sont atteintes sans avoir recours à l'extraction de ces précieux organes. By Ore Taveau. Paris, 1837.

² Sursulfate d'alumine anhydre et l'extrait alcoolique et éthéré du pistacia lentiscus de l'île de Chio.

The evidence presented warrants, I think, the presumption that Taveau's own statement in the fifth edition of his "*Hygiène of the Mouth*," published at Paris in 1843, fixes the date of his first use of the silver paste years after it had been used by others, and that crediting him with having first introduced amalgam to the dental profession is an error. We will now ask, How did this error originate?

In 1841, J. Lefoulon, a dentist of Paris, published a treatise upon the "*Theory and Practice of Dental Surgery*." This was translated into English by Dr. Thomas E. Bond, Jr., and published at Baltimore in 1844 by the American Society of Dental Surgeons. In this treatise Lefoulon refers to the silver paste as the invention of Taveau,¹ and we can readily imagine that the American dental public, who had been so recently excited by the advent of the Crawcours and their royal mineral succedaneum, an amalgam supposed to be a French invention, would at once accept this version of its origin. Shortly before the publication of Bond's translation of Lefoulon, the fifth edition of Taveau's "*Hygiène de la Bouche*" appeared, containing the account of the "*pâte d'argent*" I have quoted; and we may readily imagine some dentist seeing this, and, being curious to know when this work first appeared, would naturally consult a dental bibliography, possibly that found in Maury's or Fitch's "*Dental Surgery*," and there seeing this work dated 1826, may have jumped to the conclusion that this account had been carried over from the first edition. This I have shown conclusively to be an error. It first appeared in the fifth edition, published in 1843. No dental bibliography that I have seen notes the various editions of this work; all note only the first or the second editions of 1826. We have evidence that Taveau called attention to the use of amalgam for filling cavities before the date of his book, and that it had been a matter of discussion among Parisian dentists, since it is mentioned in Lefoulon's work, published several years before, and also that objections which had been made to it are referred to by Taveau. Lefoulon states that it takes several days to harden, and suggests, as part of the instructions given by Taveau, that it takes about two hours' trituration to thoroughly combine the mercury and silver, and, for convenience, advises that a quantity may be mixed at a time, and kept in a glass-stoppered bottle ready for use. Taveau believed that the

¹ *Nouveau Traite Théorique et Pratique de l'Art du Dentiste.* J. Lefoulon, Paris, 1841, page 264. Bond's Translation of the same, Baltimore, 1844, page 147.

hardening of the amalgam was due to the evaporation of the mercury by the heat of the mouth. This erroneous idea continued to be entertained for many years by those who opposed its use in this country. Taft¹ says, "Amalgam fillings, in a short time after their insertion, undergo a hardening process, caused mainly by the evaporation of the mercury. The consequence is, either that the mass becomes porous or that it contracts."

The earliest published formula for preparing amalgam for dental use I have so far found is in a little work entitled "A Popular Treatise on the Structure, Diseases, and Treatment of the Human Teeth," by J. L. Murphy, London, 1837, published, it will be noticed, at about the time Taveau says he discovered the silver paste. Murphy says, discussing materials for filling cavities of decay, on page 104, "In cases where a large cavity is excavated, and the gold will not suit as a succedaneum, other material must be had; something in the shape of a paste is required. I have in cases of this kind, for many years, used an amalgam of silver, prepared in the following manner; and though there are objections against it, still, until something better is laid before the public, it will be found of a highly useful nature. The ingredients necessary for the cement are silver filings, thinnest silver-leaf (to be had in small books), and quicksilver. A drop of quicksilver is poured out from the bottle into a small mortar, or, if more convenient, on a cloth; on this is placed a leaf of silver from the book, which, being worked into the quicksilver, becomes speedily amalgamated with it; another leaf is then added, and so on until the amalgam is a thick paste; if there be too little quicksilver in this amalgam, the want will be made perceptible by its non-adhesion, and, on being worked between the fingers, by its crumbling. If, on the contrary, it possesses too much mercury, it will be too soft, and the mercury may be easily squeezed out.

"When the amalgam is brought to a proper consistency, having just sufficient mercury to enable it to be used as a paste, a small quantity of silver filings should be mixed with it: these absorb a portion of the quicksilver, and hence there is insufficient mercury left to keep the silver in a soft state; thus, after the filings are introduced, the amalgam gradually hardens. Here, then, we are in possession of a cement which may be used in a soft, cold state; yet, on being placed in the tooth, speedily hardens in the cavity."

¹ A Practical Treatise on Operative Dentistry, Philadelphia, 1859, page 89.

This brief notice of amalgam secured for this writer from the editor of the *American Journal of Dental Science* a rather sharp criticism,¹ for in those days a kind word for amalgam was in this country an unpardonable sin.

When, by whom, and where amalgam was first introduced into dental practice I have been unable to ascertain. Dr. J. F. Flagg, writing under date of Boston, December 5, 1843,² says that, under the names of royal succedaneum, enamel cement, bone paste, diamond cement, mineral paste, and lithodeon, compounds of mercury and other metals have been in use the last thirty or forty years. While we cannot regard this as an authoritative statement, it, taken with many others of like import, establishes the fact beyond dispute that it was well known long before its reputed discovery by Taveau. It is quite likely that it made its advent shortly after Regnard, in 1818, published his memoir, advising the addition of mercury to fusible metal as a means of reducing the heat necessary in packing it into properly excavated cavities of carious teeth. We have evidence that early in the forties, in England, amalgam was in use, made from alloys containing, in combination with silver, tin, copper, zinc, gold, platinum, etc. Amalgam was more kindly received in England than with us, and now and again English writers have remarked that they could not understand the unreasoning opposition to it in the United States; the "amalgam war" was a mystery that they were unable to fathom. The first real improvement known in this country—the well-known formula of four parts silver and five parts tin—drifted over from England during a correspondence preceding the first advent of crystal gold in the early fifties or before. In this way it came to the knowledge of Dr. William M. Hunter, of Cincinnati, who gave it a practical test, and, being pleased with the results, during a meeting of the American Society of Dental Surgeons, convened at Cincinnati, May 8, 1855, exhibited a number of fillings made with it in the mouths of his patients to some of the members, among others, Dr. Elisha Townsend. On his return East, Dr. Townsend, in reporting to his professional brethren upon matters brought out at this meeting, mentioned this private exhibit of amalgam fillings at Dr. Hunter's office, and repeated the formula and instructions for preparing the alloy and amalgam as given by him, always, however, scrupulously crediting the information to Dr. Hunter.

¹ *American Journal of Dental Science*, vol. ii., September, 1841, page 155.

² *Ibid.*, vol. iv., March, 1844, page 210.

He was surprised at the interest it excited, and not at all pleased; for Dr. Townsend was one of those who believed that it were better that a tooth should be *lost* than be *saved* and made comfortable by amalgam, and in a communication to the profession a few months before his death took back all that he had ever said in its favor.¹ The statements now and again made, that the profession is indebted to him for an improved formula, is a pure fiction, as much so as is the statement that amalgam was introduced to the profession by O. Taveau in 1826. Both have been thoughtlessly made. Their constant repetition is not so much due, perhaps, to carelessness and indifference of dental writers as to the neglect of the profession to provide for them the means by which errors such as these may be corrected.

THE FIRST MEETING WITH PATIENTS.²

BY DWIGHT M. CLAPP, D.M.D.

MR. PRESIDENT AND FELLOW-MEMBERS OF THE HARVARD DENTAL ALUMNI,—Our friend Joe Jefferson gave an informal talk at the University Club not long ago, during which he was asked which he considered the more difficult to act, tragedy or comedy. He said he did not think he could answer the question better than to repeat the reply of a late English actor when asked the same question. He said, in substance, "Let me be never so weary and out of sorts, I can pull myself together enough to act tragedy at my best; but comedy,—ah, that is a serious business!"

To me it is a serious business to stand before so many Harvard men and talk about the first meeting with patients.

In 1868 or 1869 I had several large gold fillings put into my superior bicuspsids by one of the brightest Boston operators of that time, a brilliant mechanic, but lacking in anatomical and collateral knowledge, such as is offered the students of the Harvard Dental School to-day. As a result, the pulps of these teeth were not properly protected, and much trouble followed.

While living in Geneva, in 1870, one or more of these teeth

¹ See Dental News-Letter, vol. ix., October, 1855, page 85, and vol. xi., April, 1858, page 169.

² Read before the Harvard Dental Alumni, "Alumni Day," June 27, 1898.

died. It may have been the result of the shock caused by the declaration of war between France and Germany, but I always laid it to too close proximity of the fillings to the nerves of the teeth. I treated them myself as best I could, and some time afterwards the late Dr. Moffatt, whom many of us older ones remember with peculiar affection, treated one by piercing the alveolus at the point of the root.

With very slight interruptions, these four dead bicuspid have been perfectly comfortable for more than a quarter of a century, and are now doing perfect service, reinforced by gold caps. Naturally I have great respect for some so-called dead teeth, and these in particular.

Dreaming the other night, I seemed to experience a stab of pain in the alveolar region about these teeth. It gradually increased. There was heat, and the thumping throb preceding the abscess stage. Surely I must see a dentist.

Morning seemed to dawn. Shortly I was approaching the office-door of the village dentist. I noticed that the paint was dingy, a blind at the window hung by one hinge, and the corners of the steps were packed with accumulated dust and dirt. I opened the door, my heart seeming to occupy a greater portion of my mouth than did my teeth. One glance photographed the entire office on my mind. There was a hole in the carpet, the covering of the chair was ragged, the operating-case was strewn with dirty instruments, and a glass, partly filled with water, bore on its rim the blood-marked curve of the lips of the previous victim.

And my nose, it was besieged with the fumes of last night's pipe and cigar smoke, shaded down with the perfume arising from the belligerent bacteria inhabiting the cuspidor.

I was startled by a not over-gentle salutation,—“Well, how are you?” “Can you tell me,” I meekly asked, “if the doctor is in?” “Yes, I'm him. What's the matter with you?” I began telling him my troubles. “Oh, dead teeth, is it? Yer can't do nothin' with 'em. The only thing is to pull 'em out, and have in one of my plates adjusted to heat and cold. Got 'em fixed now with my new process, so that they are just as good whether the mercury is down to zero or whether she's a stickin' right up through the top of the glass. Great thing, I tell you!”

“But,” I suggested, “these teeth have been dead a long time, and have not troubled me.” “Troublin' you now, ain't they? I tell you there can't be nothin' done for dead teeth but to pull 'em out. Never was one but would have been better out than in.

You better set up here and let me yank 'em right out, and have it over with. You never will get no comfort until you have one of my plates, adjusted to heat and cold."

Just then the pugilistic bacteria got in another round, and I mustered up sufficient courage to feebly say that I thought I would try them until afternoon, and, if they were no better then, I might have them out. As I stepped out, half expecting to be forced back by some invisible power, I heard, as the door closed behind me, "Nothin' like that plate of mine, perfectly adjusted to heat and cold."

On reaching the street, I was reminded by another twinge that my troubles were not over. "Why not consult Dr. Hifalutin?" some one suggested, so I at once sought his office. On being ushered into the doctor's presence, I gave him a history of my troubles. He listened in grave silence, and, as I proceeded, I could see that he considered my case a desperate one, and that he must brace himself, so to speak, in order to do it full justice.

After I had finished the details, he majestically waved me towards the operating-chair, and said if I would be seated he would try to ascertain, by concise observation, if the condition of the affected parts gave pathological evidence corresponding to the train of symptoms I had narrated.

As he raised my lip and caught sight of my teeth and gums, his face darkened, and I could see that he considered the situation exceedingly complicated. "Yes," he said, "I fear the organs have lost their vitality; sometimes, however, great pain is exhibited in the bicuspid region when there is really no lesion there, the real cause being located in some one of the dentes sapientiæ. In your case, the appearance of the gingival borders would indicate stasis. The alveolar ridges may have become denticulated from the inflammatory action, causing the hypertrophy of the membranes and great preponderance of the circulatory fluids. Sometimes these cases, if not properly diagnosed and skilfully treated, lead to the most serious results. I had a case, the other day, that started from the same cause as this, where the osseous tissues involved included not only the alveolar plates, external and internal, the maxillary bone, and the superior and inferior turbinate, but also, I suspected, a slight affection of the extreme end of the nasal. These teeth had been deprived of their central nutritive organs only twenty-six and a half years, instead of twenty-eight, as yours have. The effect on the soft tissues was much more apparent to ocular interpretation. The mucous and submucous membranes

were much distended. The masseter, external and internal pterygoid muscles were somewhat rigid, the stylo- and hyo-glossus more or less constricted, while the condition of the orbicularis oris and the levator labii superioris aëque nasi was such as to give a most strained and interesting appearance, from a purely scientific view, to the mouth on that side."

Cold perspiration was beginning to start from every pore.

"It is exceedingly fortunate for you that you came to some one able to diagnose and scientifically treat such a rare and complicated pathological condition.

"It will be necessary, I fear," he continued, "to trephine the external alveolar plate over the buccal root of the first bicuspid, curette the tract of suppuration, and insert a canula to insure perfect drainage for the broken-down and disorganized products of decomposition during the process of granulation and repair."

Drawing a long breath, and pulling myself together as best I could, I managed to faintly articulate that, if what he had said should strike my cerebrum with sufficient force to wake it up, and if the result should be a differentiation of his diagnosis and his prognosis, and if my medulla oblongata should insist upon it, I would return in the post-meridian to be operated upon.

Again I found myself in the street, discouraged and at a loss which way to turn for help. Suddenly raising my eyes to an attractive house, I saw, in modest letters, the name John Smith, D.M.D. I was filled with hope at once. Surely, *John Smith, D.M.D.*, must be able to aid me. Without hesitation I entered his neat apartment. Here, as at the other places, the whole surroundings were stamped on my mind in an instant. There was no display of wealth, but neatness and artistic harmony everywhere. It was homelike; there were no guillotines hanging from the windows or ceiling, no electrocuting appliances boldly displayed. There was no show of steel to further excite my already high-strung nerves, and no smell of ether to suggest that I must take an anæsthetic, or carbolic to indicate the sterilizing of scalpels and gouges. Everything was just nice.

A cheery voice said, "Good-morning." Turning, I saw a gentleman. Gentleman was stamped on form, feature, and bearing.

I again told my story, this time into a willing and sympathetic ear. The interested, thoughtful, and pleasant face of the doctor invited confidence. "Surely," he said, "teeth that have served you so long and well shall have our best efforts to keep and preserve them useful for a long time yet."

With a snow-white napkin and dainty fingers he lifted my lip to make the examination. With great care and minuteness he noted every feature of the case.

"I do not think we need expect any serious trouble," he said. "There has been some disturbance of the circulation about these teeth, but I hope it will be of short duration. I will make an application calculated to allay the inflammation, and you may hold cold water in your mouth or apply ice to your face to keep the blood away from the part as much as possible. If this fails, after a few hours' trial, you must come back. There are many other things I can do to promote a speedy return to health."

My fears allayed, there was immediately a lessening of the blood tension, and an improved condition which always follows when one has had an interview with his physician, in whose skill and honesty he has entire confidence.

I awoke with the feeling that I had found a dentist in whose hands I could safely trust my teeth; one whom it would be a satisfaction to have as my confidential dental physician, and a worthy associate wherever we might chance to meet.

UNITE THE FORCES.¹

BY GEORGE H. CHANCE, D.D.S., M.D., PORTLAND, ORE.

WHEN President McKinley issued his proclamation calling for volunteers to drive the Spaniards from Cuba, the latent fighting forces, which were scattered far and wide, had to be brought together, organized, and properly drilled and equipped before they could become effective and utilized. Not only so, there had to be a union of sentiment in the purpose for which the fighting bodies were organized to bring about the splendid achievements of our army and navy, which have resulted in such glorious victories to our arms, making a proud epoch in the onward march of our nation, in the emancipation of millions of human beings from the tyranny of a grovelling superstition united to a despotic power.

It is sometimes said by the unthinking that there is no sentiment in business, which is certainly a mistake, for had there been no national sentiment in behalf of the starving Cubans and no

¹ Read before the Pacific Coast Dental Congress, August 24, 1898.

indignation aroused at the blowing up of the "Maine," this country would not have voted the men and money it has done to prosecute the war against Spain, and which in the short period of less than five months has terminated so successfully in behalf of suffering humanity, and of placing this nation in a position to command the respect, if not the admiration and love, of the whole civilized world.

Now, this matter of sentiment, that sometimes is thought too lightly of, when properly directed and united for a fixed purpose, becomes a great moral force, underlying all true success in life, whether individually or collectively, and, think as we may, it is this principle which brings us together as members of the Pacific Coast Dental Congress, imbued, I trust, with a common sentiment united for a fixed purpose, that each may do his part in making its sessions a new point of departure, in lifting our profession, on the Pacific Coast at least, to a higher plane of moral and professional excellence, and this will be done if a well-directed sentiment is allowed to govern our actions. This paper has not been written so much for the purpose of emphasizing the value of this sentiment among the ethical members of the dental profession, however valuable that may be, but is an effort to try to arouse a sentiment which shall be the instrument to unite the forces which go to make up the medical and dental professions, for we cannot deny the facts, if we would, that there is not that union of sentiment and fellowship between these two bodies which it would seem ought to exist. Not that there is any special antagonism between them, but that in a sense, as professional men, they are strangers to each other, quite as much so as are lawyers and physicians; useful to each other at times, but ordinarily seeming to have no special interest in common. This to the thinking ethical dentist is all wrong, and ought not to be.

Let us trace the cause and perhaps we may find a remedy for the complaint, and while we say all hail to the grand old profession of medicine, yet your essayist must be true to history, which teaches that, in the not very distant past, medicine, neglecting one of its functions, permitted the dental branch to be broken off from the parent stock, to be mutilated and kicked about by every tinker or blacksmith who happened to come along, until at last a few far-seeing medical men, of an appreciative turn of mind, picked up the apparently lifeless branch and, lopping off the dead boughs, planted it in a new but nevertheless medical soil, and by careful and persistent cultivation on the part of the successors of the original planters, from time to time adding such compost to the soil as the

case seemed to require, there has been produced from that broken branch a large, healthy tree of thrifty growth, bearing fruit of a quality not to be excelled by the old medical tree itself. Of course, the young tree, like the old, has to be sprayed from time to time in order that the parasites shall do as little damage to the fruit as possible.

Now, if this dental tree is of the same stock as all other branches of the medical tree, though of an independent growth and development, it logically follows that there should be a full and free exchange of the fruits of each without involving arbitrary conditions by which such exchange may be made; therefore, whatever medical men of the past may once have thought of dentistry, the stomatology of to-day, as taught and practised, is no longer an unknown quantity, but is truly as much a branch of the healing art and entitled to as full recognition, as such, as are the other branches termed specialties in medicine.

It is often urged by medical men, when spoken to on the subject, that the dental graduate, to be in touch with the medical profession, must possess the medical degree; but why should this be? The medical colleges have not now nor ever have had the facilities or the inclination to teach students in dentistry, and perhaps it is well that it is so; but because this branch of medicine is of independent growth, is no good reason why physicians and dentists should not be in full professional touch with each other.

It was of vital importance to this nation that General Shafter should be in full touch with Rear-Admiral Sampson at the taking of Santiago; notwithstanding, Shafter and Sampson were not educated in the same school of war; but we must not forget that in each of the schools in which these men received their fighting education, the line of studies up to a given point were the same, the fundamentals in both schools being identical, so that in their conferences and consultations they thoroughly understood each other, and were thus enabled to act in concert for the common interest. Now, why should not the same sentiment exist between the graduate in medicine and the graduate in dentistry in waging war against human disease? It is equally true in dental and medical schools, as in the schools referred to, that up to a given point the line of studies are the same. All the fundamentals in both schools being identical, and as thoroughly taught in the one as in the other, thanks to the scientific progress made in all departments of human knowledge, they are united in the preliminary preparation on the part of the students. The unnatural estrangement which now

separates the two professions will soon be a thing of the past, and in its place a feeling of professional brotherhood will be aroused which does not at present exist. In order to bring this about there should not be a disposition to flatter the physician on the part of the dentist, nor on the part of the physician to flatter the dentist, for the one is the peer of the other, and though the professional service rendered may differ in character, it does not in quality. Let us then as dentists do all we can in a dignified professional way to bring ourselves into closer touch with the members of the mother profession, and this we may do by always applauding the action of the medical profession in the establishment, which it did a few years ago, of a stomatological section as part of all international medical congresses. It will then only remain for the State medical societies throughout the Union to follow the example of the International Congress, to bring about a greater respect for the members of each profession, and this union, when accomplished, will teach us how much each has to learn before one is competent to sit in judgment over his professional brother, and to hasten forward the time of this much-wished-for professional millennium.

It is suggested, if not thought to be too presumptive on the part of a dentist to make it, that the local medical societies throughout the land amend their by-laws so as to admit as associate members all graduates of reputable dental colleges, they paying like dues and having like privileges with the other members, except the right to vote on the business affairs of the society, and let the same thing be done, on the same terms, in all local dental societies towards medical men, giving them all the rights and privileges of the society except the right to vote in governmental affairs.

It is further respectfully suggested to our medical brethren that they use their influence to have the medical colleges establish, in addition to the special chairs already established, chairs on dental pathology, that the diseases of the dental organs and associate parts, often so closely related to the eye, ear, and other reflex disturbances of the body, may be better and more generally understood than at present by students in medicine.

Then all would be better able to discriminate between the ethical and the non-ethical in both professions, and thus, I take it, we would unite all the reputable forces of the medical and dental professions in the legitimate war each is trying to wage, more or less successfully, against human disease.

REMINISCENCES OF A EUROPEAN TRIP TO THE INTERNATIONAL MEDICAL CONGRESS AT MOSCOW, RUSSIA, AUGUST 19 TO 26, 1897, AS A DELEGATE FROM THE AMERICAN MEDICAL ASSOCIATION AND THE ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.¹

BY W. G. A. BONWILL, D.D.S., PHILADELPHIA.

(Concluded from page 712.)

WE are off to "London Town" as the last of the places designated on the tour where I was expected to hold forth, and you can understand how hard at last the self-imposed burden had become, which had not been fully considered, when the statement was made by the journals that clinics would be held at certain cities. Up to the hour for leaving for home (on the grandest steamer afloat) not one hour's indisposition had been experienced; not even in Rome, in the hottest and most risky season of the year.

One week now in London. I was met at the cars and at once conducted to a hotel near to the old Tomes offices, where every minute of time was laid out for me in entertainments, talks, clinics, and visiting the dental schools, which were now in full working order. The stay was too short, preventing me from meeting many good men who were out of town on their vacation, and I had to forego seeing my friend Charles Tomes, and his former assistant, Mr. Baldwin. However, Mr. Baldwin left his flats at my disposal, to go and come at pleasure, and his associates left nothing undone to make the time spent a thing long to be remembered.

I had not been long in the hotel before a delegation came in to give me the programme for the week.

My old friend Cunningham, of Oxford, was not slow in putting in his appearance, to talk up his Manual Training School, and have me not neglect his pet scheme, the education of boys in the art of knowing what to do with their fingers as well as their hands. While upon this subject let me say that he has had a great deal of courage to engage in such an undertaking; one which can never do him credit and justice, as it requires too much of his life and robs him of too many hours from his practice and from his rural home amidst the old educational buildings of Oxford, where he lives a bachelor's life with his devoted mother. I told him it would prove a thankless pro-

¹ Read before the Odontological Society of Pennsylvania, March 12, 1898.

cedure and leave him quite penniless and chagrined to find at last that it had not realized his ideal. It is a work for the city to do, not for one man. While the object is a commendable one, yet it is not a wise one, for he can fill in his time and expend his energies to far better advantage to himself and the world by adhering strictly to his practice. I hope he will see it as I do, and relinquish it before he finds himself losing practice in endeavoring to teach boys their A-B-C's before entering a dental school. His attention to me was brotherly and lovely, and the hours I spent in his office and at his picturesque home were among the most pleasant of my stay.

He gave me an insight into his methods and general practice, which evidenced his efforts to save human teeth, combined with a boundless love for the work. It was in the right direction, yet nowhere in Europe could I find the contour system developed as in America.

His method of immediately placing in a normal arch any tooth, however irregular, I could not regard as justifiable. It can be done, but it is a question with me, as I fairly said to him, whether it could not be accomplished by better methods.

His work in this line was principally at the hospital, where the class of patients had no means for correction of irregularities, and this was his principal plea for the practice. It is my opinion that it would have been better for them to have been given artificial teeth at once at the expense of the hospital.

He saw the barriers in his way, and I feel sure he will hardly carry out the plan. It seemed sufficient for him to know that he could make it a success in some cases, and with that as an experiment he should rest satisfied, and acknowledge that prudence dictates its abandonment even in the children that are found among hospital cases.

I had hoped to meet personally both Mr. Charles Tomes and Mr. Baldwin, his successor, but they could not wait any longer for me, their hour of vacation having arrived. Particularly was I desirous of meeting Mr. Tomes, as he had taken such an antipathy to my views against evolution, and had taken the trouble to secure the opinion of a celebrated mathematician in regard to my drawings. His reply was, "Why this man is trying to square the circle." Mr. Tomes had never heard me explain my discovery of the anatomical laws of the human jaw. He knew nothing of it himself, and had no right to place any estimate upon it, *pro* or *con*, but should have awaited my demonstration.

Aside from my own deductions, he could have easily seen the laws underlying not only all the art of prosthesis, but of general anatomy, and he should have embodied the result in his dental anatomy, and let the evolution part of it go for another occasion. I will remind him just here that he will one day give me as much or more credit for this discovery than anything I have done, and his regard for me will only be the greater. He has said too many good things about my work to attempt to cast me into ridicule and kill it by sarcasm, as he has tried to do in his anatomy.

Mr. Baldwin was of great assistance to me in 1889, on my visit to the First International Dental Congress in Paris, where he accompanied me, and was my patient and assistant. I found him one of the best all-round men I met, and I regret he was not in London while I was there.

As I before stated, he placed his flat and servants at my disposal, but I could not enjoy the luxury, as every minute was consumed in London. His two companions in practice made up well for his absence. Both elegantly entertained me individually at dinner, and gave me attention every hour of my stay.

It was my intention to call upon Dr. J. Leon Williams, but I had him mixed up in my addresses with another Dr. (Lloyd) Williams, and the very limited time before sailing prevented my seeing him. An invitation had been sent me before leaving home to speak and clinic before the British Dental Association that met at Dublin, but it was impossible for me to be present.

I never fail to see the Coffin family, as their gentle demeanor and kind attentions to me in 1881, on my first visit to London, and again in 1889, was most conducive to my pleasure. While the head of the house has gone, yet they hold together, and I found them as lovely as ever to each other and to me. The Coffin boys as well as Dr. Bonnell were with me much. Mr. Walter, from indisposition, had given up his fine practice, but is again by degrees getting into the harness. He is a man well posted on most all subjects, and is a splendid conversationalist. It was refreshing to me to meet him. An evening was spent with him and the family out of London, where love and harmony reigns.

Ash & Sons and the Dental Manufacturing Company were visited, and their stock and manufactory examined. Surely no men could take more pride in their work, and their constant endeavor seems to be to have the dental world have the advantages of their means and facilities in the production of everything needed in practice.

Several American dentists in London gave me attention, and

joined in one of the dinners given me, and were very kind. So much time was consumed on the social side every evening, and visiting of dental schools with talks and clinics during the day, that half a day was all I had for outside pleasure; but I gave it up freely that I might mingle with men who are generous gentlemen and make no distinction between nationalities.

Amalgam is used here by the ton. The copper amalgam must go out of use when it is known that failures do not come alone from the material used in filling, but from the shaping of cavities, how far to cut, and, above all, in knowing how to pack in amalgam to prevent leakage and recurrence of decay.

Mr. Tomes and his former assistant, Mr. Baldwin, are using my method of packing amalgam under bibulous paper, following it with dry chips of the alloy to absorb all mercury.

An American dentist at one of the dinners given to me in London was extolling cataphoresis in a case of removal of a live pulp in a second inferior bicuspid. The whole operation consumed about thirty-five minutes. I asked him how long it took to produce obtunding? This was rather stunning to him. Thirty minutes alone for the current left him five minutes for filling the pulp-canal and gutta-percha for the crown. I gave my experience of years before in the same line by the simple current alone, and the operation was completed immediately, with no wasting of half an hour and no rubber dam; and now I remove a living pulp without anything, simply holding the breath, without rapid respiration, unless the pulp be inflamed. This takes about thirty seconds,—made in three moves: first, drilling or exposing fully the pulp; second, passing broach to the extremity of the root; third, twisting once the broach and complete extirpation; three separate inhalations with an intermission of a few moments to exhaust the lungs each time.

To consume half an hour in obtunding the pulp is ridiculous. A minute quantity of arsenic would have given no severe pain if an application had first been made to subdue inflammation. It does very well for dentists who are not busy to fool their patients in this manner, but it is wrong practice.

I met at the same dinner party another American dentist, who practised in London and elsewhere, who had told me when I was in Europe in 1889 that he had doubled his practice in dollars in the past two years. He volunteered to tell me the secret of such a marked success. He said, "Since I became familiar with gold crowns, I no longer take the trouble to fill teeth with gold or amal-

gam, if at all difficult, such as I once did with your electric mallet, and resulted in such a satisfaction to me. I now cut off all such cases posterior to the cuspids. This pleases the class of patients coming to me, and I get double pay for it."

Such a practice is an explanation of why so many all-gold crowns and gold bridges are placed on teeth, not only in Europe but in America, and is a blot upon the dental profession, and is, in fact, doing away with the highest art in dentistry,—the filling with gold, amalgam, and other materials. The dollar rules the hour with dentists as well as the rest of the world. But this craze for crowns and bridges has swept over the dental world, and the man who will not place on gold caps and insert bridges by mutilating human living teeth must go by the board, for he is considered not up to a high professional standard. Besides, it has so far superseded the practice of sectional plates, held by clasps, that there has been a falling away from this commendable practice. Any ignoramus can stick on by cement a poorly fitting gold cap to a mutilated tooth, sharpened to let it go on loosely. In all such work I observed, both here and at home, that the laws of articulation are comparatively lost sight of.

To record my personal experiences with the many with whom I came in contact would make a volume.

I visited the schools and watched closely the work done by students in the clinics, and found as much to commend in the teaching by demonstrations and operations as anywhere in America. At Guy's Hospital one thing pleased me above all else seen in the schools. At each chair there was an individual wash-bowl with an ample supply of towels, so that no student could have an excuse for dirty hands and instruments. This is an innovation worthy of commendation, and well calculated—better than all the germ teaching—to make them careful and thoroughly clean operators. This always brings success, and comes nearer to making dentists gentlemen. This was in strong contrast to many colleges which I had visited in America, where only one and never more than half a dozen bowls were found in the clinic rooms. I can, however, say more for these schools now, for in the past few years new buildings have been reared, with more complete equipment. Were I an investigator of bacteria I would make search to discover why the pulp-canals are not invaded to the apical foramen and cut out for us, instead of our having to use drills and sulphuric acid in nearly every case treated.

In one thing I saw no advance, here or anywhere in Europe, and

which, in my judgment, would secure more success in the art of filling with any and all materials. Until greater contours (what I call "plus contours") are made, no approximal fillings are safe from subsequent caries. This can only be done by taking more time to gain space on interproximal walls, by wedging with gutta-percha for weeks and months, and then, when amalgam is more thoroughly understood, and ability is acquired to pack it, and when gold is used less on all teeth posterior to the cuspids, will there be an advance in this line, more teeth saved, and fewer of the detestable gold crowns and bridges used.

Until the system of charging a given or a fixed sum for every operation, simple or compound, is thrown aside, no man can do his duty. The temptation to put in as many operations as possible during the day prevents the possibility of charging by the character of the operation and time consumed thereon. More teeth could be saved, would men but rise above this prevailing custom, and have the courage to charge for amalgam what it is worth when well done.

I have so often been asked, "Bonwill, do you get paid for all the temporary gutta-percha fillings you put in?" My reply to all is, "Yes; my patients even pay me for my thoughts (my advice), as it saves them from many operations." The system of requiring all students who enter the schools in this country to be fully taught in mechanical work before they matriculate is worthy the highest praise. This should always be done. If the student is incapable in this, then he should not be allowed to pass a collegiate course. Let the student attempt to get clear of the dirty work of the laboratory, and he will be worthless. The students in London are from a higher class than most of those in America, and better educated, and stand a better chance to rise socially. Another important matter: we should have access to the offices of all, and see what is being done to private patients, or special clinics should be given by the best men, where all those in full practice can go to measure their qualifications.

As I remarked before, the dental world here must more fully recognize that, instead of so much talk over the science of bacteriology and how to combat the germs that are said to be the active agents in the decay of human teeth, if they would put their wits to work and look with the eye instead of the microscope, they would find that the mechanical relations existing in the mouth would give a philosophy of action and almost complete prevention of recurrence of caries, after filling with gold, amalgam, or oxyphosphate, or even gutta-percha. More time should elapse between

the first excavations made and the completion of the final filling, that a plus condition of the approximal surfaces should be had, and then doing away with the rubber dam in the preparation of cavities at the first sitting. This gives full opportunity to cut up high under the gum-border and removing all superfluous soft tissue, and allow time for separation and healing of the parts and the restoration of the alveolus. To this we must add the almost complete abandonment of gold in any shape, and learn how to use a proper amalgam, and how to make these plus contours; and, I must further add, to learn to charge for amalgam such prices as are commanded for gold fillings,—proportionately, I mean. To this one other item which cannot be overlooked or failure will surely come,—to never fill upon the approximal surfaces without cutting through upon the occlusal and trimming all weak walls that mastication is sure to break away, and when both approximal surfaces are involved to make a triple compound filling. Do not fear the cavities cannot be shaped to hold the filling. The cavities are abandoned too soon, and gold caps substituted where amalgam would preserve for years. Then use all porcelain crowns.

Too much gold, not cutting away the walls far enough, and too little interproximal space! These three points fully observed will entail upon the germ theory a rightful oblivion. Not forgetting that, germs or no germs, proper filling, and previous preparation, there are some teeth doomed to go to the wall, from innate constitutional want of molecular vitality to hold the atoms together; and yet these can be saved many years by the practice herein stated. Unless we carry out the golden rule, or (I will say) the *amalgam* rule, and do as we would have others do to us, we cannot succeed with any practice, and this can only be done by men who are naturally adapted in every sense for this highest of all arts upon the human body. *More than all else that results in failure is the work of incompetent operators.*

To say more of my trip would consume too much time, and try the patience of readers who know Bonwill's failing to exhaust whatever he undertakes. A volume could well be written of what occurred. But let this suffice. I trust all here and abroad, who may happen to see this article, will credit me with having so conducted my talks and clinics given as to honor dentistry everywhere. These have not come from an "American dentist," but from a cosmopolitan, willing to impart whatever he had gained in a life of forty-four years' service in the dental profession.

For mistakes or wrong impressions given to those whom he

met he will be pardoned, as all has been said to help on our work for humanity. The only regret is that more could not have been done in the short time allotted at each place, and see more of actual practice at the chair. Yet no one was ever shown more of this, nor could men have acted more generously in every respect.

The tour was well ended in the last dinner given me, where both English and American dentists were present. Here the stern realities of the office were set aside, and the social came in to make one feel that without such minglings we would lose much of the amenities of professional intercourse, and the world outside would be a meaningless name and "life not worth the living."

The hour having arrived for my departure, I was escorted by my young friend, Dr. Schelling, to the cars, and I could say adieu to all Europe with a thankful heart for the pleasant stay and the treatment vouchsafed me, and that my life was yet spared and in excellent health.

The highest honor I felt I received was on reaching home. To be let alone, as I had always been, to follow out my own inclinations and ideas. Not a man came to see me to say, "Bonwill, I am glad that you received such honors and represented us so well;" and at my society meeting even the president and secretary left the room without speaking a word of comfort. But it remained for the Chicago profession to finish up the grand tour by giving me a good time at their clinics, February 21 and 22, and the general and special attention during my stay there.

I trust this trip will teach me how many good fellows there are in the world, and that I have more friends than foes, and, after all, that home was worth having, life worth living, and *dentistry worth practising*.

Abstracts and Translations.

A SIMPLE SALIVA EJECTOR.

BY J. J. H. SANDERS, L.D.S.I.

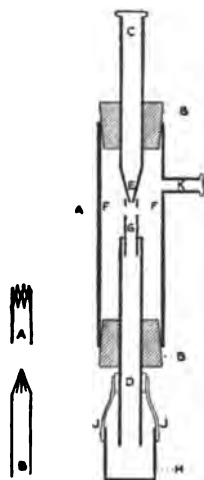
THE saliva ejector has become such a necessity in the every-day life of the dentist that no operating-room can be considered properly equipped without one. The instrument described below makes no claim to elaborate appearance, but it can be depended on to do its work, and has the merit of being both easy and cheap to construct.

In its simplest form it can be easily made in about one hour by any one who can soft-solder, and I think the following particulars and drawing will make its construction clear.

Before describing the ejector it may be well to give a rough outline of its action, so as to render the details more intelligible.

Referring to the sectional drawing, it will be seen that the ejector consists of the tube A, forming the body of the instrument, the ends of which are closed by two corks, B, B.

Through these pass two smaller tubes, C, D, the upper one terminating in the fine jet E, and the lower having a short piece of smaller tube soldered in it, as at G. The upper tube C is attached to a water-supply, and a fine stream issues from the jet. This, in rushing through the narrow tube G, carries with it some of the air, thus creating a partial vacuum, to restore which air passes through the small holes (shown at F, F) drilled in the tube. In order that the vacuum may be formed and maintained in the throat (G) it is essential that the end of the tube D should dip under water, otherwise air would pass up the tube, and no vacuum could be formed. This condition is obtained by slipping a small bucket



over the end of the tube D.

The ejector is best made from brass tubing, and for this purpose fishing-rod ferrules are admirably suited. These may be obtained in all sizes and at a small cost at any fishing-tackle maker.

The body tube A is about three and one-half inches long and three-fourths of an inch in diameter, on the back of which is soldered a plate of brass (not shown in the drawing) for the purpose of screwing the ejector to the wall. A short length of tube, K, is also soldered at a convenient point for attaching the suction-tube.

The corks used for closing the ends of the main tube must be specially selected for their soundness, and may with advantage be dipped in melted wax before using. Two lengths of smaller brass tubing, about one-fourth or five-sixteenths inch, are taken to form the tubes C and D. As will be seen, the upper tube C terminates in the point E, which has a fine aperture to allow a jet of water to pass. Possessors of a turning-lathe will, of course, turn this up, but if one is not available, proceed as follows: A series of cuts

are made with a fine saw at the end of the tube and triangular pieces removed, as shown at A, Fig. 2; the remaining pieces are then bent together until they form a point, as at B. Soft solder is then run into the cuts, and the small hole drilled with a fine drill in the engine.

This hole must be quite smooth, and about one-thirtieth of an inch in diameter, and must be so drilled that the jet is thrown in the direction of the axis of the tube. If the ejector is to be attached to the water-supply by rubber tubing, it will be well to solder a ring of wire at the top of the tube to prevent its being blown off by the water-pressure. This finishes the upper tube.

The lower tube D has a short length of small brass tube soldered into its upper end to form the throat, as at G; it should be about four times the diameter of the jet aperture, and about three-fourths of an inch long. It must be soldered centrally into the larger tube D, which may be adapted to receive it in the same manner as the jet was formed.

Two or more holes of about one-sixteenth inch diameter are drilled in the throat at one-eighth inch below its upper edge, as shown at F, F, to permit the air and water to be drawn from the body of the ejector. Before putting the parts together there remains the bucket (H) to be made. For this take a short piece of tube about three-fourths of an inch in diameter and one inch long, and close one end by soldering in a disk of brass. Two narrow strips of brass are then soldered to the other end, as shown at J, J, and these, having been bent to the proper curve, are again soldered to a short piece of split tube which will just slide over the end of the tube D.

The parts may now be put together. First the holes must be bored in the corks to take the tubes C, D, for which purpose a cork-borer should be used if one is at hand. If not, however, the holes may be made by taking a piece of the same tube as C and D are made from and, having sharpened one end with a smooth file, slowly pushing it through the cork with a twisting motion. The corks are now tightly inserted into the main tube, and the tubes C, D pushed through until the jet fits into the throat G; this insures the jet being central with the throat, and gives steadiness to the tubes. The bucket H is pushed on the end of D until the tube nearly touches its bottom, and the ejector is ready for use. It will work best on a high-pressure water-supply, but will also do its work well if supplied from a cistern, provided a fall of four or five feet can be obtained.

The following conditions are necessary for successful working :

1. All joints must be tight.
2. The jet of water must pass through the throat G without touching its walls.
3. The end of the tube D must be under water when working.

—*Journal of the British Dental Association.*

Reports of Society Meetings.

NATIONAL DENTAL ASSOCIATION.

(Continued from page 732.)

DISCUSSION.

Discussion of Dr. B. Holly Smith's paper on "Removal of the Dental Pulp."

(For abstract of paper, see page 702.)

Dr. Barrett.—There is much in the subject which needs clearing up. The author of the paper attributes the death of the pulp under arsenical application to the action of the arsenic on nerve tissue. Arsenic is a corrosive agent; it induces necrosed conditions of osseous tissue. If death is due to constriction at the apical foramen from forced stasis, how is it caused when there is no open foramen? If the arsenic is not securely sealed in the tooth cavity, the effects are just as fatal upon the buccal tissues as upon the pulp itself.

Dr. Hungerford.—The spirit of the paper was not an exemplification of pathological conditions, the use of therapeutic agents and surgery being the key-note. I am opposed to the contamination of the blood-stream by the introduction of therapeutic agents, as by hypodermic injections. I treat pulps surgically, varying the method according to conditions. After the application of arsenic to the pulp, death is due to congestion in the pulp-chamber, not at the apical foramen.

Dr. Patterson.—Pericemental inflammation after pulp removal can always be avoided by removing the pulp by surgical methods. Cocaine can be forced into the pulp until it is completely anæsthetized, using very finely pulverized crystals of cocaine. With the chloride of ethyl spray the pulp can be so congealed that cocaine

can be forced into it by means of pressure with punk, cotton, or gutta-percha. The pulp can then be removed absolutely without pain.

Dr. Taft.—I abandoned the use of arsenic twenty years ago. Its effects are objectionable not only upon the pulp itself, but extending to other tissues. The results are too uncertain. With increase of facilities other methods are so efficient that there is no longer any excuse for its use. Cocaine, finely pulverized, is readily taken into the pulp by absorption until it is so anæsthetized that it can be removed with as little pain as a paring from the finger-nail. When the pulp is removed by surgical procedure and all soft tissues removed from the canal, and hemorrhage arrested, then is the time to close it up. Seal it up immediately, and there is no liability of any change pernicious to its welfare.

Dr. Watkins.—When I have a large cavity with free access, I prefer to punch the pulp out with a slim piece of orange-wood. It is instantaneous; the pulp is removed entire, and the tooth is ready for filling.

Dr. Barrett.—Those who oppose arsenic as a dangerous drug advise the use of cocaine! Which is the most dangerous? It is "jumping from the frying-pan into the fire."

Dr. B. H. Smith.—The surgeon who uses cocaine knows the liabilities and is prepared to combat evil effects. The trouble with arsenic is that we do not know what the results may be.

Dr. Crawford spoke of the importance of preventing septic infection (which he prefers to call *toxic invasion*) by stopping each root as soon as the canal is emptied, not leaving it open to serve as a means of self-destruction while operating in the other canals.

Dr. Smith, in closing the discussion, said that he had desired to present the record of some clinical cases, but had concluded to wait and study them further.

REPORTS OF SECTIONS.

Section I. recommends that chemistry be attached to Section V., as the little that has been offered during the past year has been so interwoven with therapeutics that it properly belongs to Section V.

Empiricism holds a powerful sway in prosthetic dentistry, and until more attention is given to the science of prosthesis and less to the detail of mechanical procedure it cannot hope to occupy a prominent place in the national body.

Section I. presented a paper by Dr. L. E. Custer, entitled "Recent Improvements in the Electric Oven, and Methods of determining the Heat in the Fusion of Porcelain," of which the following is an abstract:

In the improved oven the perfection of detail has all been in the direction of producing the highest heat in the oven cavity, with the lowest possible heat of the platinum wire, which in the Custer oven has been reduced step by step by perfecting every available point that might be of advantage, until it is so reduced that it will now stand hundreds and perhaps thousands of heatings.

Dr. Thomas reports having used nearly one hundred ounces of Close material without a burn-out, a conservative estimate of which would be that the oven was heated from eight hundred to one thousand times. This result has been attained by making every inch of the walls heat-producing surfaces (except the two small openings), arranging wires over the entire surface as closely together as can be without touching laterally, the wires being also brought to the surface of the clay, placing them only deep enough to be caught, so that nothing intervenes between the wire and the object heated. The wires are also placed closer together as the distance from the centre increases, so that all portions of the cavity are equally heated. This idea, original with Dr. Custer, is now being copied in electric culinary utensils. The discovery of the fact that the negative end of the wire becomes about one-fifth hotter in a constant electric current than the positive, led to the method of winding the oven with the negative end of the wire more extensively than the positive, and solves the most perplexing problem, and the oven may now be said to be perfect in every detail.

Dr. Custer described two methods for determining the heat of the oven. One is by the use of a thermometer, which he inserts in a clay cup outside of the oven, having a twenty-gauge platinum wire, of which one end enters the oven cavity, the other terminating in the cup which encloses the bulb of the thermometer, the heat of the cup end being always exactly proportionate to the end of the wire in the oven.

Another and better method—one under complete control—is by the use of an arc light. By means of a little frame, placed on the top of the oven, a small carbon is held opposite the upper opening, another carbon, which is movable, being held in a guide. When it is desired to see the condition of the porcelain the movable carbon is pushed towards the fixed carbon until the two are in contact.

The movable carbon is then withdrawn a short distance, and a brilliant arc will be struck, throwing such a strong light in the oven that the operator sees the porcelain melt as distinctly as if in the open air. There is no guesswork, and the eye is relieved of the great strain of trying to see an indistinct object.

DISCUSSION.

In the discussion of Dr. Custer's paper, Dr. H. A. Smith asked if a method had been discovered by which platinum scraps could be melted by the electric current, and yet retain the qualities of pure platinum?

Dr. Custer stated that when platinum was fused on a block of carbon, so much carbon was taken up, the resulting metal was changed similarly to the conversion of iron into steel, having the qualities of platino-iridium. To retain the softness and ductility of the platinum it should be fused in lime, when it will equal the new platinum as when first bought.

Dr. Tileston inquired how Dr. Custer's arc-light illumination of the electric oven compares with the method employed for illuminating the Downie furnace?

Dr. Custer replied that it differs as much as the arc light differs from an incandescent light.

Dr. Molyneaux spoke of the importance of being able to recognize with exactness the fusing point of porcelain. With more accurate methods and less guesswork, more porcelain work will be done and better results will be attained.

Section II. The report of this section was devoted to a brief review of the new text-books, of which the past year has been so prolific. The committee suggest that in future editions of these works and in new text-books a glossary of terms employed be inserted, as a feature calculated to be of great value to the student; one of the great needs of to-day being a comprehensive dictionary of dental terms, giving the proper orthography, punctuation, etymology, and definition.

The section has decided to take the first steps in this direction, and asks the co-operation of the entire National Association, suggesting that the chairman and secretary of each of the ten sections take steps to secure a list of all the important words in their respective branches, sending the same to Section II. at as early a date as possible.

Section II. offered a short paper, by Dr. William Ernest Walker,

of Pass Christian, Miss., entitled "Cast and Model," of which a brief abstract follows:

CAST AND MODEL.

Dr. Walker spoke of the confusion which has existed in the past with regard to the use of the terms *cast* and *model* as used in prosthetic dentistry, which led to the recommendation, by the Committee on Nomenclature of the American Dental Association, that the use of the term *cast* be discontinued, and that the term *model* be used exclusively.

Dr. Walker had found, however, a very positive necessity for the retention of the two terms, in order to avoid descriptive detail in dealing with his students and laboratory assistants. He therefore makes a distinction, as follows: The first step is the *impression*; this gives a matrix, in which is poured the *cast*,—which is not a model of anything, but which, *as a cast*, is ready for use in the construction of a vulcanite, celluloid, or cast-denture. If, however, swaged work is intended, the cast is, by the proper manipulation, *converted into a model* by so shaping it that it will represent the metal die that is to follow.

The successive steps, then, are, first, "impression;" second, "cast;" third, "model;" fourth, "sand-matrix;" fifth, "die;" sixth, "counter-die." This consecutive series is readily fixed in the mind of the student; each step, as named, representing a definite stage in the production of an artificial denture; a well-defined object, to which neither of the other terms in the series can be applied. If the student or laboratory man is told to make a "cast," he simply pours the plaster into the impression; but if told to make a "model," he first pours a cast, and then trims it into such shape that it becomes a model for the "die" which is to follow.

DISCUSSION.

In the discussion of the paper, the author was sustained in his position by Drs. Goddard and Barrett.

Dr. Goddard said he was very glad to hear the paper read, as it covers clearly the points that he makes in his lectures on prosthetic dentistry, and he moved that the Association approve the distinction made in the paper.

Dr. Guilford took exception to this, saying that he had gone over the ground very carefully. The Committee on Nomenclature had thought it wise to use one term, in place of two, whenever it was possible. The only difference between a cast and a model, in

prosthetic dentistry, is that of a half-inch in height, which is not enough to necessitate the use of an additional term. It is better to call both "models," even though, strictly speaking, one is not always a model which is to be copied. In teaching prosthetic dentistry for many years, he had never found any confusion to arise from this method of designation.

Dr. Molyneaux said that for years he had made substantially the same distinction, and had argued in favor of that distinction at the Asbury Park meeting, but had yielded to the recommendation of the committee.

Dr. Goddard contended that more difference existed between a cast and a model than that pointed out by Dr. Guilford; the cast is not only increased in height, but it must be trimmed, in order that it may drop readily from the moulding-sand when it is to be used as a model.

Dr. Barrett.—Cast is the proper noun to be used to designate the object of the process of *casting*; we do not *cast* a model. A model must be manipulated with the fingers; a cast is the result of mechanical crystallization. We are working for the world, and a final decision on such points should not be reached by snap-judgment. We are not prepared to vote intelligently until we have given the subject more thought.

Dr. Molyneaux said that his argument on the point in question had been carefully prepared for presentation at the Asbury Park meeting, but it had not been taken up; he thought it should have received more consideration.

Dr. Barrett moved, as an amendment to Dr. Goddard's motion, that the paper be referred to the Publication Committee, and that the point in nomenclature be referred back to Section II. for further consideration.

Dr. Goddard withdrew his motion in favor of that of Dr. Barrett.

After some further discussion, Dr. Barrett withdrew his motion, which was, however, renewed by Dr. Weeks in substantially the same form, and adopted.

Section III. reported better organization of sectional work, and recommended the encouragement of the development of this section, as it has, perhaps, the largest element to draw from in the Association.

The section presented one paper, by Dr. B. Holly Smith, a brief abstract of which is presented on page 702.

Section IV. offered no report, neither chairman nor secretary being present.

Section V., Dr. Cassidy, chairman. Dr. Cassidy read a report on "Dental Materia Medica," of which we give an abstract, as follows:

The deluge of drugs of antiseptic quality, following the acceptance of the bacterial genesis of many oral diseases, has culminated in a tendency to ignore the very new remedies, and investigate more thoroughly the virtues of those more or less well known, which are comparatively simple in their chemical and therapeutic action, time-tried and reliable, non-secret, and not even proprietary.

The professedly new introduction, formaldehyde, is the active principle of the earth of ant-hills, which, from time immemorial, has been gathered by the people of continental Europe, and used successfully, by local application, in the domestic treatment of swellings, bruises, suppurating sores, abscesses, rheumatic pains, etc.

Dr. Cassidy stated that he introduced this compound to the American Dental Association in 1894. It was then classed as a combined disinfectant, antiseptic, and germicide. These claims have been found to be based on solid truth, but its irritant properties render it unpleasant to use in the mouth without a corrective. Some cases of sloughing of the gums from its use, even when diluted, are reported.

It is, however, a very complete sterilizer for extracted teeth intended for use in technic instruction, and there is no agent known which will so thoroughly and safely sterilize burs, excavators, etc., dipping them, after cleansing, in full strength formalin, and wiping dry.

The latest phase in cataphoresis is the application of the definite rules of electrolysis, so that the proper pole to be used in connection with the different cataphorics may be readily selected. Non-conductors also, as alcohol, chloroform, phenol, tincture of iodine, etc., can be used successfully, the pressure of the current itself, as conducted by the tissues from pole to pole, inducing these agents to penetrate farther than by mere absorption.

Dr. Cassidy concluded his report with a criticism of an article published in the June issue of the *Dental Cosmos* (from the *Journal of the British Dental Association*), detailing a series of experiments by Drs. Kemp and Brush, on nitrous oxide, proving its specific anæsthetic influence as distinct from any inert gas. Dr. Kemp

says, "With regard to the general metabolism, the result of these researches is to show positively that carbon dioxide in the arterial blood is greatly diminished, and is *not* increased, so that any theory involving the dependence of anæsthesia on a retention of carbon dioxide within the system is in opposition to the direct findings of these experiments." Dr. Cassidy criticises the implied statement that carbon dioxide escapes from the body by means of the arteries. He suggests that if Dr. Kemp examine on the venous side of the capillaries instead of on the arterial side, after giving his dog an average dose of nitrous oxide he will find strong evidence of the accumulated carbon dioxide. Nitrous oxide, when inhaled, goes through the arterial circulation unchanged, superseding, for the time being, iron,—the oxygen carrier of the body; when the capillaries are reached, it gives up its oxygen to form the same combination with carbon, hydrogen, etc., that atmospheric oxygen produces, but to a greater extent.

The carbon dioxide developed thus cannot escape freely, for the reason that the reduction of the ferric oxide in the arterial blood not being accomplished, the iron is unprepared to convey the carbon dioxide as ferrous carbonate to the lungs. If, however, either free oxygen or air be administered simultaneously, or at short intervals, one of the physiologic functions of iron is restored sufficiently to prevent cyanosis, and the animal may thus be kept indefinitely in the anæsthetic condition, without danger of asphyxiation.

It is gratifying to know that this—the carbonic acid theory of anæsthesia by nitrous oxide—is being investigated by such an institution as the Johns Hopkins University.

Passed without discussion.

Section VI. not ready to report.

Section VII. Anatomy, Pathology, and Surgery. W. C. Barrett, chairman.

Dr. Barrett, in his report, referred to the collection of specimens in comparative odontology, exhibited last year at Old Point Comfort, as being probably the finest ever gotten together.

He reviewed briefly the literature of the past year on the subjects germane to the section.

Of the papers and lantern exhibitions by Dr. J. L. Williams, of London, and M. H. Cryer, of Philadelphia, the first apparently proves that the vascular supply of the tooth-pulp must come from the pericementum, and that the old cuts of the text-books, repre-

senting the inferior dental artery as giving off branches which enter at the apical foramen of each tooth-root, are misrepresentations of the real condition, the pericemental membrane being, in fact, the placental membrane, which supplies the tooth-pulp with nutriment. The preparations of Dr. Cryer, on the other hand, would seem to prove that the old text-books were correct; but neither in the exhibition of Dr. Williams nor in that of Dr. Cryer was anything conclusively presented. Dr. Williams must prove that his preparations positively bear the interpretation placed upon them by him; Dr. Cryer must determine, by injections, that there is direct communication of the dental pulp with the dental artery before his deductions can be accepted as final.

In dental surgery nothing specifically new has been presented. Dr. Brophy's operation for the radical cure of cleft palate seems to continue successful. The most surprising fact noted in connection with this operation is that, although bringing together the divided palatal walls necessarily contracts the upper jaw from one-third to one-half, which would be expected to result in a permanently deformed upper jaw, with the superior teeth inside of the lower ones, yet this has not been the result in a single case. The superior jaw has developed into the normal size, the deciduous teeth erupting in perfect occlusion,—a mysterious process in nature, and a lesson in surgical procedure that may well engage earnest attention.

In pathology nothing has been definitely settled in regard to pyorrhœa alveolaris. The advocates of the different hypotheses still hold to their pronounced views, but have not demonstrated their claims to the satisfaction of others.

Difference of opinion still exists as to the use of drainage-tubes in the treatment of antral troubles. The arguments for and against are reviewed in the report, and the conclusion reached that a cavity that must be drained should be left permanently open so long as there is any pus-formation; that tubes, plugs, and tents are necessarily mischievous in their nature, as tending to retain the discharge and perpetuate the septic condition; the presence of a tube also causing exuberant granulations around its borders.

The precise nature of the action of arsenic upon vascular tissue and the changes succeeding its application to the dental pulp have never been sufficiently demonstrated nor explained. It has been claimed that the death of the pulp is caused by congestion, producing strangulation at the foraminal apex; but this cannot be the case in a partially developed tooth, to which arsenic proves as fatal

as in the case of the completely formed root. Its application to the mucous membrane of the buccal cavity produces equally serious results. The action of arsenic on the dental pulp is not essentially different from its effect on internal tissue when taken internally, and seems to indicate special dynamic energy. The minimum amount required for pulp-devitalization has not been definitely ascertained, but the mistake usually made is that of using an unnecessarily large amount, causing an intensely inflamed, irritated condition of the corpuscles of the cementum at the extremity of the root, creating an exceedingly sensitive point, apparently non-devitalized pulp tissue at the apex, to which a second application is usually made. This simply serves to destroy the vitality of the apical cementum, often inducing serious trouble. If the tissue in the pulp-chamber is found devitalized, there is no question about that in the root-canals. If a sensitive point is reached, instead of making a second application of arsenic, the arsenic present should be neutralized by an application of dialyzed iron, and anodynes employed until all further danger from the poison is averted. The root canals can then be cleansed and filled.

The new books on subjects germane to Section VII. were considered by Section II.

DISCUSSION.

Dr. Brophy said, in regard to the treatment of diseased antrum, the opening must naturally be made at the most dependent part,—the canine fossa. In serious cases it must be sufficiently large to permit of thorough exploration and ocular observation. A canula, with a flange on the outside to hold it in place, is essential to thorough irrigation of the cavities. A small opening is of no avail, except for the temporary evacuation of the cavity.

Dr. G. V. I. Brown prefers to pack the cavity with antiseptic gauze, the tube being a source of disease. The gauze packing does not interfere with the process of healthy granulation, and has not the disadvantages of the drainage-tube.

Dr. E. H. Smith said that if the disease were due to dental irritation, proper treatment of the dead tooth, thus removing the cause of the disease, was often sufficient, evacuating the antrum through the root-canal of the tooth, without making a large opening.

Dr. C. N. Peirce agreed with Dr. Smith.

Dr. Crawford said there was no field in which more mistakes in diagnosis and treatment are made than in antral trouble. He has seen no less than five cases, starting from a tooth and opening

into the nasal cavity, which had been diagnosed and treated as antral trouble.

Dr. Brophy said that in serious chronic cases a large opening is necessary, but in a large majority of cases the repeated washings and drenchings do more harm than good.

PYORRHOEA ALVEOLARIS.

Dr. Patterson said that he did not believe there was such a thing as pyorrhœa alveolaris without deposits. A *shaving process* will often remove deposits which the probe fails to find, the cure following showing that these minute deposits were the cause of the trouble. Small patches, not to be seen except with a strong eye-glass, are as irritating to the pericemental tissue as larger accumulations.

Dr. Barrett said that where there are pockets there are always deposits; but in many cases, where there is a wasting, purulent condition of the pericemental membrane, there may be no deposits.

THE BROPHY OPERATION FOR CLEFT PALATE.

Dr. Patterson said that he had formerly been pronounced in his opposition to the Brophy operation for cleft palate. He wished now to go on record as in favor of it, having been convinced by a knowledge of three successful cases. He had never seen, by other methods, anything that approached a success, the only object of such operations being the improvement of the articulation, which by the Brophy operation is a success.

Dr. Barrett considers the operation the grandest triumph of our profession. As the Great Physician anointed the eyes of the blind and they saw, so modern oral surgery touches the lips of the dumb and they speak. For the first time in the history of surgery, *cleft palate can be cured*.

Dr. Brophy was invited to prepare an address on the subject of surgical operation for cleft palate for the next meeting, and promised, provided the meeting be held within a convenient radius of Chicago, to present several small children who had been operated upon at a very early age, that the results of the operations may be seen.

Section VII. offered three papers,—(1) "Anatomy: A Critique," by William Ernest Walker; (2) "The Comparative Method of teaching Dental Anatomy," by A. H. Thompson; (3) "Paper illustrated with Slides," by M. H. Cryer,—which were next read.

Dr. Walker directed attention to a few errors which have

crept into the 1897 edition of Gray's "Anatomy," to which the attention of students should be directed.

In the definitions of the names of the surfaces of the teeth (page 932), they are given as labial, lingual, buccal, distal, and proximal. Distal is defined as "the surface away from the mesial line," and proximal as being the reverse of distal. Dr. G. V. Black's definition of proximate or proximal, "applied to a surface of a tooth (either distal or mesial) which is next to another tooth," is more satisfactory. Mesial, however, is not given as the name of a tooth surface, neither is it anywhere defined, although in the text it is universally substituted for proximal, as defined. (See page 933: "The mesial and distal surfaces are triangular," "short mesial" and "long distal" cutting edges, etc.)

Looking up the word mesial in the dictionaries, the student would be led to believe that the mesial plane or line must pass antero-posteriorly between the superior central incisors parallel with the tongue, and that consequently the surface of the tooth which is towards the mesial line must face the sides of the tongue.

This was certainly not the idea intended to be conveyed by the definition of the proximal surface of a tooth.

Dr. Black's definitions of distal and mesial, as accepted by the Committee on Nomenclature of the American Dental Association (*Transactions*, 1895) are more perspicuous: "Distal: away from the median line of the face, following the course of the dental arch;" "Mesial: towards the median line of the face, following the curve of the dental arch."

On page 935 we read, "The movement of the human mandible is forward and downward, the resultant of these directions being an oblique line, upon an average of 35 degrees from the horizontal plane." As authority for this statement, a foot-note refers to "W. E. Walker, *Dental Cosmos*, 1896." The statement, as given, is misleading, and is not a correct deduction from the article referred to. *Mandible* should read "mandibular condyle;" "35 degrees from the horizontal plane" should read "40 degrees from the facial line." A plane perpendicular to the facial line could be termed *horizontal* only while the latter was absolutely vertical. The plane of condyle movement forms an average angle of 35 degrees with the plane of occlusion, the latter forming an average angle of fifteen degrees to a plane perpendicular to the facial line, which plane forms an angle of from 40 to 50 degrees with the plane of condyle movement.

Dr. Walker next takes issue with the statement that when the

lower jaw is advanced until the cutting edges of the incisors are in contact, the molars also come in contact, thus relieving the strain upon the incisors. This statement, first noted in Bödecker's "Anatomy and Pathology of the Teeth," and repeated in more definite terms in the 1897 edition of Gray's "Anatomy," is amplified in Dr. Burchard's recently issued "Anatomy and Pathology of the Teeth," as follows: "While the jaws are in position, with the incisors in occlusal contact, they do not bear alone the stress of whatever muscular force is applied; but it will be seen that the distal cusps of the third molars, the highest points of the dental arch, advance and meet the distal cusps of the upper second molars, so that when the incisors are in edge-to-edge occlusion, although all of the other teeth are separated to an extent governed by the overbite, the dental arch is supported posteriorly by contact of the last molars, thus preventing undue stress upon the incisors."

Dr. Walker said that his studies of articulation and occlusion had convinced him that this statement is not based on fact. In order to test the point, he had on one occasion taken casts of students' mouths at the Dental College, taking them as they came, rejecting only those mouths in which very many teeth had been extracted, until he had taken and was prepared to exhibit thirty-three casts of jaws with the teeth in edge-to-edge occlusion. Of these, seven were excluded because of abnormality, there being no overbite in the position of rest. Of the twenty-six left, twenty-two had the molars *entirely free* when the incisors were thus placed end to end. One has contact of the molars on the right side only, where the second and third molars have come forward, due to the loss of the first molar. The second case, in which there is molar contact, has lost the left upper second bicuspid and left lower first molar; also the right lower second bicuspid and the first molar. The third of the "contact" cases has no bicuspids and only one molar on the left lower side, and shows great weight of the incisors. He has also casts of three unusually symmetrical mouths, with the teeth both in normal occlusion, and also in the *biting position*. These casts also fully sustain the position that, as a rule, the molars are not in contact when the incisors are in the edge-to-edge position. He has concluded that the idea must have originated in a misunderstanding by Dr. Bödecker of Dr. Bonwill's advice to construct *artificial dentures* with what he calls "a balancing articulation," making the artificial molars meet at the same time that the incisors meet, in order to support the plate and prevent its displacement in mastication.

The error which appears to have thus originated with Dr. Bodecker has apparently been perpetuated by subsequent writers, without any effort being made to either confirm or refute it, as far as known to the writer, who requests that, if investigations have been made on this point, the results be made known, that a definite conclusion may be reached as to the correctness or otherwise of the statement with which he takes issue.

(To be continued.)

Editorial.

THE LAST MONTH OF THE YEAR.

THE last month in the year naturally marshals the thoughts of men and women into order and reflection. Exactly why this should be, one day, one month, or one year, more than another, is a problem of the human mind not easily explained. The sentimental side of human nature is always paramount, and probably is the outweighing force that leads the thoughts of most people into the reflective vein on such occasions. Yet there is a side to this retrospection beyond sentimentalism, and one that belongs more nearly to the outgrowth of humanity towards higher planes of active thought and practice.

It broadens the mind to drop for a time local interests and local contentions and expand the view over the world's activities. The study of history enlarges the horizon of every person, and is, in a minor degree, the equivalent to extended travel, than which there is nothing better to enlarge the sphere of thought, and to bring the self-opinionated and egoistic man to an appreciation of his limitations and narrowness.

Thus each year brings with it the reflective period, and as we come to the last month of the year 1898, the feeling is impressively present that the year 1900 will soon be with us, closing the century, and will terminate one hundred years of great progress in every direction.

Dentistry has much to be thankful for in a retrospect of these years, for this century has witnessed its development from the crudest beginnings to a position worthy the respect of all men.

While we may with gratification look back over the past, the wise thinker will not dwell thereon. The past is always safe. Like our dead loves in the neighboring cemetery, we need feel no concern for their cast-off organisms, but the living spirit that animated these is of ever-increasing interest. So the dead past is an educational memory, but the vital interest lies not there, but in the activities of the present and in the hopes of the future.

The year has been one of deep anxiety and sorrow to many households. Youth has with generous enthusiasm gone out to battle, and the graves of the martyrs have been more than filled. Time can alone determine whether the sacrifice of blood and treasure will be worthy the close of the century. War is a relic of our barbaric instincts. It is the crude method of the savage to establish his authority. To the thinking man or woman this killing of men to advance the civilization of the world seems a moral paradox, yet, as far as our limited vision will enable us to peer into the unknown, it will remain the most potent method in establishing "Peace on earth and good-will to men." It means eventually the "survival of the fittest," and then will come upon the ruins of empires the period when "swords will be beaten into ploughshares."

The progress of dentistry the past year has not been remarkable. No startling innovations in theory or practice have been made. There has been activity, but it has not resulted in any modification of practice. Much was hoped from the college association known as The National Association of Dental Faculties. The work performed by this body has, it is surmised, come up to expectations. It is leading the educational thought into correct channels, and can be depended upon to do this in the future, providing it crushes professional politics in its incipency. The caucus has no place in this body, and, it may be hoped, will never get within the bounds of the organization.

The professional portion of the world in this country, knows that the National Dental Association was not satisfactory. It is not difficult to find fault, but an explanation for the failure is not so readily found. The war, heat, and a score of other reasons have been given, but they do not meet the real explanation in the estimation of the writer, and this lies in the fact that localities have so changed the method of former years that State, interstate, and local society combinations have centralized the interest to such a degree that the same men who will work enthusiastically for these subordinate bodies will not care to repeat the effort for an association meeting but once a year, and it may be a thousand miles from

home. Dentistry needs an association of a different character. The writer outlined his views in the address before the last meeting of the American Dental Association, and he has nothing to add thereto. The central body should be the distinguishing body, composed of the best elements of all below it. When this is accomplished, men will travel across the continent to have the honor of uniting in its deliberations.

While there has been much to discourage in the past twelve months, the failures give the promise of a better outlook for the future. Individuals, societies, professions, all grow by their failures, providing the sufferers are made of that stern material that is ever ready to build the new house on the ruins of the old, and make it more worthy the period. Thus the past year, with its glories and mistakes, may become the indicator of progress to be held in worthy remembrance by those who succeed us. The year 1898, therefore, while not prolific in much for dentistry, has a value for those who are able to read the lessons of the years, as they come and go, and profit thereby.

SPECIAL NOTICE.

ATTENTION is called to an advertisement upon another page. An accident practically closed the professional career of the advertiser, and he desires to dispose of the volumes of the *Dental Cosmos* from the first issue. To those who contemplate having a private library there is nothing better as a foundation than the volumes of a dental journal.

Bibliography.

INFORMATION FOR THE PATIENT AND DENTIST. A Magazine for the Reception-Room Table. Published monthly by L. P. Bethel, Kent, Ohio, November, 1898.

This is the first number of a somewhat novel publication to educate "the public in regard to the better care of these important organs, the teeth.

The proper education of the public in regard to the care of the

teeth has been one of the most important duties of the practising dentist. The lessons have been only partially learned, and the majority of people to-day regard the dentist as a last resort for the relief of pain. Various methods have been resorted to to bring about a better state of things, and this attempt of Dr. Bethel is warmly welcomed as a means to that end.

The present number opens with an article by Dr. Case. This is in line with his well-known and valuable work; but the question arises whether it is not too abstruse for the ordinary lay reader? The need is for short articles, free from technicalities, showing the importance of attention to the teeth from the earliest period to the final development of the permanent series. This is the object of the editor, and it is believed he will faithfully carry it out. This first number contains several articles of special value in this direction.

The publication can be warmly welcomed, and it should be upon the table of every reception-room for the education of both young and old.

GOULD'S POCKET PRONOUNCING DICTIONARY. By George M. Gould.
P. Blakiston's Son & Co., Philadelphia.

The new edition of this little book comes to us much improved. It is little in size only. The number of words has been almost doubled, and the old words, as well as the new, have been carefully edited.

We all know how limited is the usefulness of some of the dictionaries to a student wishing a clear, concise definition. One is referred from place to place and word to word, in the end having a very cloudy idea or understanding of the meaning of the word in question. Many instances of this inefficient editing could be cited, which no doubt have caused much annoyance to students, teachers, and writers. This fault is notably absent in the Gould dictionaries. The results of Dr. Gould's work in dictionary making is a decided achievement, and there is probably no one to-day better equipped for such work.

In this work, so small that it can be carried conveniently in the pocket, there are twenty-one thousand useful words, with correct pronunciation and clear definition. Many of the newer chemical terms, also, have their formula given, and there are numerous valuable tables introduced. It is truly, "infinite riches in little room."

G. W. W.

Domestic Correspondence.

LEGITIMATE DENTAL PRACTICE HAMPERED BY LAW.

TO THE EDITOR:

SIR,—In a paper read before the New Jersey State Dental Society, at Asbury Park, July, 1898, Dr. William I. Wallace, of Glens Falls, N. Y., read a paper entitled "Experience with a Few Homœopathic Remedies in Dental Practice."¹ In this paper Dr. Wallace recommends a few doses of aconite, the third potency, about half an hour apart, in those cases of neuralgia of the fifth nerve, which are frequently reported to the dentist under the impression that a tooth is in fault. He also recommends a few doses of belladonna, third potency, for relief of pulpitis in its earlier stages; mercurius corr. sub. 30, a dose every hour until better, in neglected cases of inflammation, where there is evidence of pus forming; chamomilla 30, in toothache of children when the pain is due to caries, as a temporary relief, creosotum administered internally to retard certain forms of caries, and silicea as a tonic, in alveolar abscess of slow development and tardy recovery. The above gives all the suggestions directly made in the paper, and are here given that Dr. Brown's answer to Dr. Watkins's question may be understood, and its import fully appreciated. It should be noted that Dr. Wallace does not suggest a dentist branching out into general medicine. Although before entering the dental profession Dr. Wallace practised medicine, and this prior experience led to the use of these remedies, he has not, in his paper, been led by this beyond the strict limits of dental practice. All these cases, with a possible exception to the first, are purely dental, and legitimately belong to a dentist's care.

During the discussion that followed the reading of the paper the propriety of a dentist administering internal remedies, and his legal right to do so when, in his judgment, the best interests of his patient requires it, was questioned. Regarding the legal right, so far as New Jersey is concerned, and probably other States having similar laws, the following question and answer is of interest on this point.

¹ Items of Interest, September, 1898, p. 668.

"*Dr. S. C. G. Watkins.*—I would like to ask Dr. Brown if our law does not give us the privilege of prescribing medicine for dental troubles?

"*Dr. Brown.*—I doubt it; we have had one or two opinions on that, and the line is so close that it never can be settled until it goes to the Supreme Court. But I doubt very much if the courts would uphold a dentist who administered medicine in the manner suggested in this paper."—*Items of Interest*, September, 1898, p. 687.

Dr. Brown's long and active service as a leader in shaping and enforcing dental law in New Jersey gives force and weight to this expression of opinion. . . . But what has he and his associates been about to permit such a state of affairs? Their dental law, if I mistake not, expressly permits a physician to extract teeth, and to perform quite a variety of dental operations; indeed, outside of the purely mechanical operations of dental art. What may not a physician do, as a physician, to relieve a patient suffering from dental troubles? If it is, and has been, as Dr. Brown says, a disputed question whether a dentist, as a dentist, may or may not legally do all that his judgment directs to relieve a patient suffering from trouble that properly comes under his care, it is so because those who have framed the laws regulating the practice of dentistry have so permitted it.

W. H. T.

Notes and Comments.¹

PRODUCTION AND USE OF CARBORUNDUM.—The *Scientific American* says the Carborundum Company reports to us that its works have produced during the year 1896, in round numbers, 1,191,000 pounds, or 595½ tons, of crystalline carborundum. Says the *Engineering Mining Journal*: Consideration at the present is given to the production in crystalline form only, but another important industry in which carbide of silicon promises usefulness of the material. Some mention has been made of the experiments showing that carborundum can be used, and will, in all probability, take the place of ferro-silicon in the manufacture of steel. Professor Luehr-

¹ The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 1838 Walnut Street, Philadelphia.

mann, of Germany, recently wrote an article on this subject, indicating that in the use of carborundum there will be in Germany alone, approximately, two thousand five hundred tons consumed annually, provided its cost would not exceed six cents a pound. It may be used for this purpose in an amorphous form, and the Carborundum Company is prepared to furnish it at a price slightly under this figure.

TOOTH EXTRACTION FOR BLINDNESS.—A medical journal reports a case of blindness caused by crowded teeth. The patient, a boy of eleven years, was suddenly stricken blind. Several physicians were called in consultation, and one of them, happening to notice the crowded condition of the lad's teeth, advised the extraction of several of the teeth, stating that upon such action depended the child's restoration to sight. This advice was acted upon, and in a few days the boy's sight was completely restored.—*Dental Headlight*.

LIQUEFIED AIR AS A BEVERAGE.—The Paris correspondent of the *British Medical Journal* states that at a public dinner in Paris the other day, at which M. d'Arsonval was present, the guests were astonished by having liquefied air poured into their glasses of champagne. A year ago the Emperor of Germany was offered a glass of liquefied air. He raised the glass in honor of science, but refrained from putting it to his lips; the liquefied air in it would have burned them like hot coals. The liquefied air poured into the champagne became dispersed in white clouds, and mingled with the surrounding atmosphere. A bottle of air, if liquefied, can bear a transit of sixty hours without volatilization taking place.—*Philadelphia Medical Journal*.

IODINE AND PERMANGANATE OF POTASSIUM STAINS.—Answering the inquiry for colorless iodine, I would give the following: Add a saturated solution of hyposulphite of soda to tincture of iodine slowly, and stir till the color disappears. No doubt in decolorizing in any manner there is a new chemical composition, but whether this affects the action of the original tincture or not is a question. To remove stains of tincture of iodine from clothing, skin, etc., the hyposulphite, of course, acts beautifully.

For removing the stains of permanganate of potassium from the hands or clothing, peroxide of hydrogen acts like magic.—**BRET BLACK., M.D.**, in *Medical World*.

QUICK FLASKING.—Dr. B. H. Teague, in the *Dental Weekly*, offers the following to those who wish a quick method of flasking artificial dentures: After mixing enough plaster to fill the flask, fill one-half and put in the plaster cast on plate, shape the surrounding soft plaster so as to have no undercuts. Cover this filled half with a piece of tissue or bibulous paper, brush it over with soap-solution, put on the ring of the other half, fill up with the remaining plaster while yet soft, and put on the top of the flask. It can be opened as readily as if two mixes had been made.

LOCAL TREATMENT FOR PYORRHOEA ALVEOLARIS.—After thorough removal of deposits, Dr. Younger says he uses lactic acid to create an irritation to excite granulation, protecting surrounding tissues by applying glycerin and covering with cotton. He floods the pockets, leaving the lactic acid there. At a subsequent sitting chlorate of potash, as strong as can be borne, will be found very soothing. (He only uses tincture of iodine in cases of excessive inflammation.) Deposits should be *thoroughly* removed, and pockets properly cleansed of blood, serum, etc., when one application, "once for all," will be all that is required. Failure in these respects entails failure in treatment. Success is obtained in ninety-six per cent. of cases. Lining membrane will be exfoliated, contraction follow, and gum cling closely to the root again. If syringe-point can be introduced at end of week, treatment has not been thorough and must be repeated. Lactic acid is kept in small test-tube, and can be liquefied over alcohol flame. If not warm, it causes too much pain.—*Stomatologist*.

Current News.

PENNSYLVANIA STATE BOARD OF DENTAL EXAMINERS.

THE State Board will hold examinations in Pittsburg and Philadelphia on December 6, 7, and 8, 1898.

G. W. KLUMP, D.D.S.,
Secretary.

NEW YORK ODONTOLOGICAL SOCIETY.

PRELIMINARY NOTICE.

THE New York Odontological Society will celebrate its thirty-first anniversary on Tuesday, January 17, 1899.

On this occasion the Society will hold an afternoon and evening meeting, and J. Leon Williams, L.D.S., D.D.S., of London, has prepared a paper for each session, and will be present to read them.

Afternoon Paper.

"On Certain Controversial Questions and Unsolved Problems in Dental Histology and Pathology."

A criticism of the recent paper on the structure of enamel, by Dr. Otto Waldkoff.

Further researches on enamel structure, with a critical review of the paper on tubular enamels, recently presented before the Royal Society of Great Britain by Mr. Charles S. Tomes, F.R.S.

An examination of the special forms of acid-forming bacteria found attached to the approximal surfaces of teeth.

A brief review of the work of Dr. Filandro Vicentini on the fructification of *Leptothrix buccalis*.

Illustrated by numerous photographs.

Evening Paper.

"Which shall it be, the Scientific or the Empirical Method?"

An examination of the present scientific status of the dental profession in America, as shown by its recent literature.

The results not altogether flattering.

Indifference towards scientific research.

The empirical spirit and method.

The scientific spirit and method.

Are we to have a trade or a profession?

The question not yet decided.

The duty of the colleges. The duty of the societies. The duty of the individuals.

The question of patents and secret preparations.

The French Academy of Medicine.

A plea for the formation of a new national organization, with an established fund and State branches, whose function it shall be to promote original research and all scientific work connected with the profession, and to examine and pass judgment upon all inven-

tions, formulæ for remedies, etc. Such an organization, if properly formed and managed, will be certain to prove a wonderful stimulus to progress in all directions, and at a single blow to destroy all quack remedies and useless inventions. An advance of twenty years at a single step.

The unification of the State laws regulating practice.

Shall we go forward or backward?

B. C. NASH,

F. T. VAN WOERT,

W. W. WALKER, *Chairman,*

Executive Committee.

58 W. FIFTIETH STREET.

NATIONAL SCHOOL OF DENTAL TECHNICS.

THE next annual meeting of the National School of Dental Technics will meet on the 28th and 29th of December, 1898, beginning promptly at ten A.M. with the address of President G. V. Black.

The partly made up programme is as follows: "The Value of a Graded Course of Study and Uniformity among Dental Schools," by G. V. I. Brown; "Reports of Syllabic Committees; Operative Technics," by T. E. Weeks; "Prosthetic Technics," by N. S. Hoff; "Symposium of Teaching Methods," by W. H. Whitslar, C. M. Wright, and H. H. Burchard; "Steel Technics," by C. H. Wilson; "Teaching Cavity Preparation," by C. N. Johnson. Master of Exhibits, Grant Molyneaux.

Discussions on the papers will be opened by prominent teachers. It is hoped that all interested in the newer methods of teaching in dental schools will be present. A profitable time is promised. Exhibits of class-work will be interesting. The profession is cordially invited to attend.

Meeting will be held in the Club Rooms of the Grand Hotel, Cincinnati, Ohio.

D. M. CATTELL,

Secretary-Treasurer.

904 STEWART BUILDING, CHICAGO.

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